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THE EFFECT OF GOVERNMENT SUBSIDIES ON THE
U. S. COMMERCIAL MERCHANT SHIPBUILDING INDUSTRY

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THE EFFECT OF GOVERNMENT SUBSIDIES
ON THE
U. S. COMMERCIAL MERCHANT SHIPBUILDING INDUSTRY

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I. INTRODUCTION

Statement of Introduction

Since the founding of the United States our maritime industry has been supported by protectionist government policies. These sometime ill-supported policies were further broadened in 1920 in a long range commitment to foster an efficient privately owned U. S. merchant marine adequate to meet our national defense and commercial needs.¹ Subsequent government actions have built on this commitment. One in 1946 committed the government to the long term development of an efficient U. S. shipbuilding industry, as a supplement to the merchant marine.² In practice these policies have taken the form of restricting segments of U. S. waterborne commerce to the U. S. flag merchant marine, restricting U. S. registry to those vessels constructed in domestic shipyards, and various direct and indirect subsidy supports to both the merchant marine and shipbuilding industries. On the surface the results of these policies

¹Merchant Marine Act, 1920, 41 Stat. 988, ch 250 (1920).

²Merchant Ship Sales Act of 1946, 60 Stat. 41 (1946).

have been markedly unsuccessful. In the period 1954 to 1969 the U. S. flag share of our foreign commerce decreased from 27.5 to 4.8 per cent. The U. S. merchant marine has failed to renew its fleet at the rate of other maritime powers and as of June 30, 1970 more than two-thirds of the active fleet was 25 years old.¹ Our private shipbuilding industry cannot compete with price offered by foreign shipyards and except for government support (merchant and naval shipbuilding programs) could not exist at all.

A major problem of any government maritime support program is that the "maritime industry" is a myth and does not exist. It is an amalgam of diverse shipping, labor, and shipbuilding interests which have few common interests especially when it comes to agreeing upon how limited government support funds should be spent. Programs which assist subsidized fleet operators can hurt unsubsidized operators and may not provide adequate construction work for shipyards. Programs to build more costly automated (labor-saving) ships provide shipyard employment but reduce funds available for operating assistance to marginal fleet owners

¹U. S. Department of Commerce, Maritime Administration, Annual Report FY 1970 (Washington, D. C.: Government Printing Office, 1971), pp. 1 and 27.

who cannot afford the new ships. Ship conversion programs may assist marginal operators and repair yards but be opposed by large fleet owners and major shipbuilding yards. No less vehement in each case will be the divergent labor voices of longshoremen, seagoing, and shipyard unions.

No where is the dichotomy of interest more diverse than between the ship operators and shipbuilders which are linked in a system of government support. The problem of this coupled support is best stated by Samuel A. Lawrence in a study directed towards factors affecting the shipping industry:

. . . the public policy considerations applicable to subsidizing ship operations are in many respects quite different from those applicable to subsidizing the yards. Furthermore, the present system, which gears shipyard aid to the operating industry's need for new equipment, provides no assurance that American Shipbuilding is maintained at the scale required to meet mobilization needs. Continued coupling of the two programs appears instead to represent a political marriage of convenience, which contains serious disadvantages for both partners.¹

Statement of the Research Question

Research Question: How effective have government subsidies been in carrying out government policy toward sustaining a

¹Samuel A. Lawrence, United States Merchant Shipping Policies and Politics (Washington, D. C.: Brookings Institute, 1966), p. 5.

commercial merchant shipbuilding capability in the United States and what are the prospects for the future?

Subsidiary Questions:

1. What is the U. S. commercial merchant shipbuilding industry?
2. What is government policy toward the commercial merchant shipbuilding industry in the United States?
3. What are the government subsidy programs which effect the U. S. commercial merchant shipbuilding industry? What is their cost?
4. What is the relative magnitude of the subsidized shipbuilding programs in relation to other shipbuilding and repair work in U. S. commercial merchant shipyards?
5. Have the subsidy programs encouraged commercial shipping companies to invest in new construction ships from U. S. commercial shipyards?
6. Have the subsidy programs stabilized construction workload in the U. S. commercial merchant shipbuilding industry?
7. Have the subsidy programs encouraged the U. S. commercial merchant shipbuilding industry to improve its competitive position?

8. What are the expectations that the new Merchant Marine Act of 1970 will develop and sustain a viable commercial merchant shipbuilding industry in the United States?

Purpose and Utility of the Study

It is the writer's purpose to critically examine the effectiveness of the various subsidy programs towards developing and maintaining an efficient merchant shipbuilding industry in the United States. The subject is particularly timely because under the revised subsidy programs of the Merchant Marine Act of 1970 the nation is embarking on a ten year, 300 ship construction program designed to revitalize the merchant marine as well as the shipbuilding industry. The Maritime Administrator, Andrew E. Gibson, has stated that the new program will require during the 1970 decade an investment by the shipping lines of \$4 billion for new ships, \$500 million by major private shipyards in modern facilities, and labor management relations in both industries which settle disputes without work stoppages.¹ The first two aspects of the program are within the scope of this research, the latter is not. The study of the recent past forms the basis for estimating the potential of improving the competitive position

¹Shipbuilders Council of America, Shipyard Weekly No. 48 (November 25, 1970).

of the shipbuilding industry and reaching the goals set for the new program.

In accomplishing the purpose it is necessary to define the subsidy programs their costs and their effects. Since the merchant marine subsidies effect only part of the shipbuilding industry and even there only provide a fraction of the employment, the shipbuilding industry must be analyzed to place the subsidy program in its proper context to the total ship construction effort in the United States.

Because merchant ship construction in U. S. shipyards is tied to the ship replacement programs of U. S. ship owners it is necessary to consider not only subsidies directly concerning ship construction and replacement, but also the full range of ship operating subsidies and aids. These not only have different effects on the various elements of the merchant marine, but it is probable that some may alter the economics of ship operations sufficiently to discourage the replacement of old ships.

Scope and Limitations

It is intended to limit the area of investigation to the privately owned U. S. flag ocean-going merchant marine and the major private shipyards which construct and accomplish

major conversions for it. Unfortunately an investigation of this nature is constrained by data limitations and inconsistencies in classification of shipping services, shipyard employment, and ship types. Understanding this the scope and limitations are as follows.

Time Period 1954-1971

The period of study selected is 1954 to 1971. The year 1954 marked the start of the replacement program for our war built merchant fleet and an in depth review of our merchant marine policies. Except for the influx of foreign ship orders during the 1956 Suez crisis and the break out of government ships from the National Defense Reserve Fleet (NDRF) during that time and later in 1965 to support military shipments to Southeast Asia, the period has been relatively devoid of artificial economic factors.

Merchant Marine

Consideration of the merchant marine is limited to privately owned U. S. flag ocean-going ships engaged in oceanborne commerce. Included are U. S. flag vessels in foreign trade, and U. S. coastwise, intercoastal (east/west coast), and noncontiguous (Alaska, Hawaii, etc.) trade. Excluded are ships operating exclusively on the Great Lakes

and inland waterways, special type ships such as cable ships, fishing vessels, and all government owned ships.

The focus is on dry and liquid cargo shipping. The demise of U. S. passenger shipping which occurred during the 1954-1971 period is not addressed, but because some U. S. lines operated both passenger and cargo ships the former have had an effect on government subsidy distribution and corporate financial conditions. Also passenger liners are sometimes included in statistics under the heading "Combination Passenger and Cargo".

Although not part of this study, it should be recognized that the U. S. government owned merchant fleet consisting of the small Military Sealift Command (MSC) nucleus fleet and the larger mothballed, World War II built National Defense Reserve Fleet (NDRF), have had basically a three-fold effect on private industry. First the NDRF has been a depressant on the demand for new merchant ship construction since it has been a reserve upon which the nation could draw to meet national defense shipping needs. This effect has been of decreasing importance during the 1954-1971 period and whereas the fleet consisted of 2,067 ships at the end of Fiscal Year 1954, it had dwindled to 1,027 ships at the end of Fiscal Year 1970; of the latter virtually all were close to 25 years old

and only 350 were considered suitable for reactivation.¹ Secondly, as will be discussed in Chapter III, it has been the source of trade-out ships for unsubsidized operators under the Ship Exchange Program. Thirdly the NDRF has been used to augment the fleets of private operators during times of crisis. For example during the 1957-1959 period the following number of government ships were made available to private operators under bareboat charter to ameliorate shipping shortages caused by accelerated exports of commercial coal and foreign aid grain and by closing of the Suez Canal:²

July, 1957	22
July, 1958	151
July, 1959	11

Again during the Vietnam War government ships were broken out of the NDRF to carry military cargo to Southeast Asia. This time the ships were operated by U. S. shipping companies under General Agency Agreements with the Maritime Administration. The number of ships active on the first day of each fiscal year were:³

¹MARAD, Annual Report FY 1970, pp. 15 and 71.

²MARAD, Annual Report FY 1957, p. 2; MARAD Annual Report FY 1958, p. 2.

³Estimated from General Agency Agreement data contained in MARAD, Annual Reports FY 1964-1970.

1965	2	1969	144
1966	10	1970	109
1967	120	1971	2
1968	144		

There is another fleet, not included, which should be recognized because of its commercial and national defense significance. This fleet consists of those non-U. S. flag vessels considered to be "under effective United States control" and referred to as the EUSC fleet. EUSC is a military concept and includes non-U. S. flag shipping which can be made available to the U. S. Government under request in time of national emergency. The fleet consists of those vessels registered in Panama, Honduras, or Liberia, which have been built overseas by U. S. citizens or have been transferred from U. S. registry. It came into being because of the lower construction costs in foreign shipyards; the lower operating costs, primarily due to lower foreign wage rates; and tax advantages granted by the country of registry. The effective control principle is administered by the Maritime Administration under one or a combination of four types of agreements with the owners;¹

¹U. S. Department of Commerce, Maritime Administration, Effective United States Control of Merchant Ships - A Statistical Analysis 1970 (Washington, D. C.: Government Printing Office, 1970), pp. 4-8.

1. Contracts at the time of transfer from U. S. flag.
2. U. S. ownership or U. S. parent company control.
3. War risk insurance provided by the U. S.
4. Letters of commitment.

The EUSC fleet operates in both U. S. foreign trade and foreign to foreign trade. Although smaller in number of ships, its carrying capacity is equal to that of the privately owned U. S. flag merchant marine. Its 1968 composition is summarized in Table 1. In that year the EUSC fleet carried 15 per cent of U. S. foreign trade as compared to only 6.4 per cent carried by U. S. flag ships. Its major effect is in the tanker trade where the larger, faster, and more modern EUSC ships carried 26.8 per cent of U. S. tanker cargoes. The U. S. fleet carried only 5.4 per cent. Bulk carriers are the second most important segment of the EUSC fleet. In 1968 174 EUSC bulk carriers participated in U. S. foreign trade as compared to only 4 U. S. flag bulk carriers.^{1,2}

In some measure this fleet represents an indirect cost or benefit forfeited by the U. S. subsidy policy which did not provide support to the U. S. flag bulk and tanker fleets.

¹Ibid., pp. 25-27.

²James R. Barker and Robert Brandwein, The United States Merchant Marine in National Perspective, (Lexington, Mass.: Heath Lexington Books, 1970), p. 44.

TABLE 1

EUSC FLEET

Type		DWT (In thousands)	Average Age	Average DWT (In thousands)
Tanker	268	11,846	13	44
Bulk ^a	87	3,164	15	36
Freighter ^b	45	395	25	9
Total	400	15,405	-	-

Source: U. S. Department of Commerce, Maritime Administration, Effective United States Control of Merchant Ships - A Statistical Analysis 1970 (Washington, D. C.: Government Printing Office, 1970), pp. 26-73.

^aIncludes dry bulk, ore/oil and ore ships.

^bIncludes dry cargo freighters, combination passenger/cargo, and reefer ships.

The lack of subsidy support to match the economic benefits of foreign ownership have driven these ships from the U. S. merchant marine, whereas our subsidized liner fleet is significantly superior to the World War II built EUSC freighters. Also since it is another form of a defense reserve, the EUSC fleet has been a further depressant on the national defense need for a larger ship construction program.

National Defense

There are both commercial and national defense aspects to the Federal maritime policy. In this thesis national defense requirements are considered only as they have effected the merchant marine and ultimately the U. S. shipbuilding industry. The national defense needs for merchant shipping and military auxiliaries in times of national emergency are not addressed. Nor is the important question as to what is the optimum composition of the fleet from a defense standpoint.

Major Private Shipbuilding Industry

The segment of the shipbuilding industry of interest in this research comprises the major private shipyards with a capacity to build large ocean going ships. The work of interest within these shipyards are the merchant ship construction programs. Using this definition the major private

shipyards are those with a capability to build ships 475 feet long x 68 feet beam and over, as this is the C3 type ship size, the minimum size ship built in the Maritime Administration postwar subsidized fleet replacement program. Excluding the Great Lakes shipyards, there are at present 17 shipyards with this capacity in the country.¹

The major private shipyards and the level of merchant ship construction within these yards is only a fraction of the U. S. shipbuilding and repair industry and before going further it is well to place their importance in proper perspective. In March 1970 of the 140,000 employees in the private shipbuilding and repair industry (an additional 85,000 were employed in naval shipyards) 79,000 or 56 per cent were employed in the major shipyards. Of the 61,000 direct (production) employees involved in shipwork in the major shipyards 13,000 were engaged in merchant ship construction, 32,000 in naval construction, and 16,000 on repairs.² Table 2 is a compilation of Census reports on the value of shipbuilding and repairing performed in the entire industry, identified by the 1967 Census of Manufacturers as comprising

¹U. S. Congress, House, Committee on Armed Services, Status of Shipyards, Hearings, before the Seapower Subcommittee. Statement of Andrew E. Gibson, Maritime Administrator. 91st Cong., 2d sess., 1971, pp. 10656-10657.

²Ibid., pp. 10654-10656.

TABLE 2

CENSUS REPORTS ON VALUE OF SHIPBUILDING AND REPAIRING

VALUE OF WORK DONE (MILLIONS OF DOLLARS) ^a

Year	Total Ship Building & Repair	Non-Prop. Ships New Con- struction	Self-Prop. Military Ships New Con- struction	Self-Prop. Non-Mili- tary Ship New Con- struction	Repair Military Ships	Repair Non- Military Ships	Shipbuilding and Repair Not Specified By-Kind
1954	\$ 972	\$ 71	\$ 296	\$ 227	\$133	\$240	\$ 4
1955	932	72	325	110	150	268	NA
1956	1,034	71	270	178	143	359	NA
1957	1,337	121	252	368	125	461	NA
1958	1,467	95	469	441	124	327	10
1959	1,447	77	564	378	119	301	8
1960	1,215	54	406	351	122	274	9
1961	1,360	50	501	329	165	296	18
1962	1,400	53	507	379	171	279	11
1963	1,518	82	682	243	222	277	12
1964	1,678	82	739	280	205	330	9

TABLE 2--Continued

Year	Total Ship Building & Repair	Non-Prop.		Self-Prop.		Self-Prop.		Shipbuilding and Repair	
		Ships New Construction	Ships New Construction	Military Ships New Construction	Non-Military Ship New Construction	Repair Military Ships	Repair Non-Military Ships	Not Specified By-Kind	
1965	1,918	164	742	282	335	383	12		
1966	2,160	180	822	289	413	447	10		
1967	2,358	149	974	362	423	407	43		
1968	2,360	154	885	478	363	458	22		
1969	2,437	169	869	457	384	532	26		
1970 ^b	2,550	200	1,200	400	300	410	40		
1971 ^b	2,950	240	1,330	560	300	480	40		

^a Includes value of work done on ships by the shipbuilding and repair industry (SIC 3731). Value of work done includes cost of labor, purchased materials and parts received during the year, overhead and profits. Source U. S. Department of Commerce, Bureau of Census, Annual Survey of Manufacturers, as summarized in Shipbuilders Council of America, Statistical Quarterly (Washington, D. C.: Shipbuilders Council of America, Second Quarter-1971). (Mimeographed.)

^b Estimated by Shipbuilders Council of America and Business and Defense Services Administration as contained in Shipbuilders Council of America, 1970 Annual Report, p. 6.

389 companies, which own 415 establishments only 253 of which employ 20 or more employees.¹ The value of self-propelled non-military new construction has never exceeded 30 per cent (1958) of the total shipbuilding and repairing effort, and for each year since 1962 has amounted to 20 per cent or less. Although this figure is not directly comparable to the merchant construction of the major private shipyards alone, they do make up most of the total.

Subsidy Defined

A difficult problem in any discussion of this subject is the lack of a common definition of the term "subsidy" and the lack of standard usage in the Federal Government. The term is not defined in the Federal budget document. The only Federal statutes using the word "subsidy" and the only places where it appears in the Budget are those dealing with merchant ship construction and operation. In fact the word has a negative connotation which has caused a proliferation of euphemisms in practice. The Joint Economic Committee notes that proponents of a program avoid and resent the term "subsidy". They prefer to characterize their programs as

¹U. S. Department of Commerce, Bureau of Domestic Commerce, United States Industrial Outlook 1971 with Projections through 1980 (Washington, D. C.: Government Printing Office, 1971), pp. 377-378.

"aids" or "expenditures in the national interest", while opponents label a program a "subsidy" in an attempt to suggest that it will benefit a few to the detriment of the common good.¹ After reviewing a variety of definitions and analyses of the term the committee in 1960 decided on the following definition, which is also the definition to be used in this thesis:

A subsidy is an act by a governmental unit involving either (1) a payment, (2) a remission of charges, or (3) supplying commodities or services at less than cost or market price, with the intent of achieving a particular economic objective Government loans made at lower than market rates of interest or at rates below the cost of funds to the Government and Government insurance provided at lower than private insurance premium rates may also appropriately be considered as subsidies.

This definition distinguishes subsidies from . . . aids to business . . . where the Government does not determine the program which it wishes to see fulfilled Purchases or sales made on the Government's own behalf which may prove more profitable to the private seller or buyer than comparable transactions on the open market, except where a primary motive of such transactions is assistance to a particular segment of the economy.

. . . . Classed as a subsidy is differential tax treatment for particular categories of persons or groups²

¹U. S. Congress, Joint Economic Committee, Subsidy and Subsidy-Effect Programs of the U. S. Government, Joint Committee Print, 89th Cong., 1st sess. (Washington, D. C.: Government Printing Office, 1965), p. 3.

²Ibid., p. 9.

Research Methodology

Research has been conducted through the use of written materials on the subject. The primary sources of most all data are published Maritime Administration statistics. Sometimes these data have not been taken directly from Maritime Administration documents but have been obtained from other researchers or industry groups who have compiled the data into more useable formats or who have had special access to unpublished data. In accomplishing the analyses of the effects of subsidies on ship replacement and the shipbuilding industry the author has deliberately tried not to use Maritime Administration analyses as a basis for research findings. This was done to better maintain an independent view of past and proposed subsidy policies.

Organization of the Study

Chapter II develops the background legislative acts leading to the enactment of the Merchant Marine Act, 1936. It explores the concepts of this basic statement of U. S. maritime policy, analyzes its effectiveness and describes its major modifications up to and including the Merchant Marine Act of 1970.

With the foregoing policy discussion as a foundation Chapter III describes in detail the Federal maritime subsidy

programs and their costs. Highlighted are those that involve the largest expenditures and all those that have an effect on ship construction and conversion in U. S. shipyards.

Chapter IV evaluates the effects of the subsidy program as administered by the Maritime Administration on ship replacement by the U. S. merchant marine. Special emphasis is placed upon the replacement problems of the foreign trade dry cargo fleet as it comprises the largest segment of the merchant marine and has been most directly effected by the subsidy programs.

Chapter V defines the major private shipbuilding industry, its employment, and condition. The effects of the subsidized construction program are analyzed both as an industry and an individual shipyard basis. The effects of one alternate program developed in Chapter IV are presented. The prospects for the Merchant Marine Act of 1970 reaching its shipbuilding goals are discussed.

Chapter VI summarizes Chapters I through V and draws conclusions as to the past effectiveness of government subsidies toward sustaining a commercial merchant shipbuilding capability and the prospects for the future.

The Appendix contains a glossary of terms.

II. FEDERAL GOVERNMENT MARITIME POLICY

Historical Background

The U. S. maritime industry has been under almost continuous study and review since the founding of the nation. Current maritime programs are therefore the result of a long period of trial and error policy evolution in an attempt to solve the basic problem:

How to develop and maintain a Merchant Marine and shipbuilding industry, adequate to serve the commercial and defense needs of the nation, even though American ship operators and shipbuilders cannot generally compete in international markets without government assistance.¹

Samuel Lawrence divides the post-revolutionary history of the U. S. maritime industry into three stages.² During the first phase which ended with the Civil War the maritime industry generally prospered under a protectionist shipping policy. The first tariff act, enacted by the First Congress in 1789, allowed customs duty and tonnage tax deductions in

¹ Arthur D. Little, Inc., Ship Construction Differential Subsidies (Boston: Arthur D. Little, Inc., 1961), p. 22.

² Lawrence, U. S. Shipping Policies, pp. 32-33.

favor of U. S. shipping. Another legislative act of 1789 provided that only ships built in the U. S. and owned by U. S. citizens could register under the American flag. The Navigation Act of 1817 reserved the U. S. coastwise trade to U. S. built vessels and in 1845 the ship operators received their first direct government payments in the form of mail contracts.¹

The Civil War was a turning point for the U. S. merchant marine. Many ships dropped U. S. registry to avoid Confederate raiders and the subsequent conversion from wood to steel and sail to steam left the U. S. industry at a competitive disadvantage. The maritime industry was let wither as government and public interest turned inward to the profit potential of westward expansion. The U. S. maritime industry was never again to regain in peacetime its pre-Civil War vitality.

The third stage, the revival of the U. S. maritime industry, began in the 1890's with the recognition that the merchant marine was inadequate for commercial or defense needs of the nation. No effective action was taken however until the Shipping Act, 1916. U. S. foreign commerce depended

¹Joint Economic Committee, Subsidy and Subsidy-Effect Programs (1965), pp. 43-44.

so much upon foreign shipping that when, in 1914, belligerent nations withdrew their ships from U. S. trade it was necessary to pass legislation to supplement the merchant marine by the expedient of allowing U. S. citizens to register foreign built vessels under U. S. laws.¹ The Shipping Act, 1916 subsequently created a Shipping Board for the purpose of:

. . . encouraging, developing, and creating a naval auxiliary and naval reserve and a merchant marine to meet the requirements of the commerce of the United States with its Territories and possessions and with foreign countries; . . .²

The Shipping Board was authorized to charter, construct, lease, and purchase vessels for use as naval auxiliaries. (It also was authorized to regulate merchant marine shipping rates and practices). Actual ship construction developed slowly and almost all of the \$3.3 billion of merchant shipping constructed was completed after the end of the war. This left the Board with 13.5 million gross tons of major ships (1000 tons or over); five times the U. S. pre-war tonnage. It was the world's largest merchant fleet and over half of

¹Little, Ship Construction Subsidies, p. 25.

²Shipping Act, 1916, 39 Stat. 728, ch 451 (1916).

it was owned by the Government which had no prior experience in commercial ship operations.¹

The Merchant Marine Act, 1920 was largely concerned with the transfer of the war built fleet to private interests. The lasting significance of the Act is however that for the first time it included a statement of long range maritime policy objectives:

That it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and to serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States; and it is hereby declared to be the policy of the United States to do whatever may be necessary to develop and encourage the maintenance of such a merchant marine . . .²

The Act also offered some incentives to private operators to increase the size of their fleets by construction in U. S. shipyards including a construction loan fund of \$125 million for five years and tax exemption on excess profits reserved for new construction. A companion measure, the Ship Mortgage Act, 1920, established a government mortgage program which would finance up to 2/3 of the construction costs of a ship.³

¹Lawrence, U. S. Shipping Policies, p. 40.

²Merchant Marine Act, 1920, 41 Stat. 988, ch 250 (1920).

³Little, Ship Construction Subsidies, p. 26.

Because of the worldwide shipping depression which began in 1920, immediately following passage of the Act and the surplus of war built ships, its incentives did not stimulate investment in new ships. From 1922 to 1928 no new vessels were constructed in U. S. shipyards for the U. S. flag foreign trade fleet and it was apparent that some form of direct government assistance was necessary. The Merchant Marine Act, 1928 is important because in reaffirming the policy statement of the 1920 law it for the first time provided substantial peacetime government assistance to the merchant marine. This assistance was in the form of a mail subsidy to offset higher U. S. operating costs. It marked the beginning of the concept of long term contracts for service on government determined essential trade routes in return for government subsidy. As incentives to modernize the U. S. merchant fleet and provide employment for U. S. shipyards the Act increased the construction loan fund to \$250 million, provided preferential loan interest rates on ships built for foreign trade, expanded the construction fund to include reconstruction and reconditioning, and raised the maximum government financing to 75 per cent of construction costs.¹

¹Ibid., p. 27.

The Act of 1928 was generally unsuccessful because of abusive practices in its administration. Mail contracts were awarded without competition and at the maximum rates allowed by law.¹ In 1933-34 a special committee of the Senate headed by Senator Hugo Black was extremely critical of government administration and exploitation by the private shipping interests. Concerning the construction program the special committee found that only 20 of the 43 mail contracts required new ships and these 20 contracts specified a total construction of only 51 ships. The committee concluded that, " . . . no real consideration seems to have been given to the self-evident proposition that a Merchant Marine must renew itself continuously if it is to remain a factor in national defense and international trade."²

The special committee recommended the end of government subsidies and called for government ownership of the merchant marine in its stead. It did, however, also recommend direct ship operation and construction subsidies should Congress elect to retain private ownership of the merchant marine. Congress followed the latter course and with few exceptions the

¹Lawrence, U. S. Shipping Policies, p. 44.

²Little, Ship Construction Subsidies, p. 30.

special committee recommendation for a direct subsidy program formed the basis of the Merchant Marine Act, 1936.

Merchant Marine Act, 1936

The clearest statement of the intent of this act is in its opening statement. It has been changed little through the intervening years. As originally written it stated:

It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency, (c) owned and operated under the United States flag by citizens of the United States insofar as may be practicable, and (d) composed of the best-equipped, safest, and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel. It is hereby declared to be the policy of the United States to foster the development and encourage the maintenance of such a merchant marine.¹

Title II of the Act established a United States Maritime Commission to carry out its provisions. This has been amended by executive reorganization plans in 1949, 1950, and 1961 so that there is now a Federal Maritime Commission and a Maritime Administration (MARAD). The Federal Maritime

¹Merchant Marine Act, 1936, 49 Stat. 1985 (1936).

Commission functions are regulatory in nature and include regulation and control of shipping rates, services, and practices in both foreign and domestic water commerce. The Maritime Administration as a part of the Department of Commerce has the following major responsibilities (As will be noted later the Merchant Marine Act, 1970 has made some additions to this list.):

1. Survey the American merchant marine to determine what additions and replacements are required to create a privately owned merchant fleet for essential foreign commerce which is adaptable to national defense requirements and consists of vessels designed to operate safely.
2. Determine the trade routes essential to maintain and develop U. S. foreign commerce.
3. Conduct continuing studies of the type, size, speed and other requirements of vessels for service in foreign commerce.
4. Conduct continuing studies of the relative cost of constructing and operating ships under foreign registry as compared to U. S. registry.
5. Determine on a continuing basis the extent of aid by foreign governments to their merchant marines.

6. Investigate, determine and keep current records of the number, location and efficiency of U. S. shipyards.

7. Determine new designs of vessels, methods of construction and means to promote the carrying of foreign trade in U. S. vessels.

8. Cooperate with owners and shipbuilders to secure trade preference for U. S. vessels and to construct the most modern and efficient types of vessels.

9. Recommend to Congress legislation as necessary to carry out the intent of the Act.

10. Conduct studies and report to Congress on the removal of obsolete merchant tonnage, status of U. S. tramp shipping service and comparative costs of constructing and reconditioning ships in the several coastal districts of the United States.

11. Acquire vessels constructed in the U. S. and suitable for conversion into naval auxiliaries by purchase or otherwise as deemed necessary to establish, maintain, or improve any essential service route or line in foreign commerce.¹

The principle types of aid given the U. S. maritime industries by the Act were;

¹Ibid., Title II.

1. Payment of operating-differential subsidies to qualified operators who provide regular and adequate service on one or more essential trade routes. Tramp ships, all tankers, and ships engaged in domestic trades were precluded from eligibility.

2. Direct and indirect construction aids including construction-differential subsidies, ship mortgage loans, tax deferments on construction reserve funds, and trade-in provisions of old ships for new.

The cost and effect of these subsidies are studied in detail in later chapters. The authority to award, amend, and terminate operating-differential subsidy and construction-differential subsidy contracts is actually exercised by a three man Maritime Subsidy Board headed by the Maritime Administrator.¹

The Merchant Marine Act, 1936 included three concepts;

1. The central principle is the concept of cost parity. Operating and construction subsidies are paid to U. S. flag operators in order to equalize the costs of U. S. operators with those of foreign competitors. The payments are "direct" subsidies in that Federal Budget and appropriations legislation identify them by the term "subsidy" and

¹MARAD, Annual Report FY 1970, p. 55.

they are paid direct to the maritime industry for the purpose intended. It was a deliberate intention of Congress to avoid the possibilities for abuses inherent in the indirect system of mail subsidies of the 1928 Act and to assure funds were utilized for the purpose they were appropriated. The principle of parity through direct subsidies has been modified however by a considerable number of non-parity provisions such as indirect construction aids and cargo preference. The net effect when combined with cabotage laws is to alter the parity concept and to increase the indeterminacy of the total cost of maritime subsidies.

2. Secondly the Act was primarily a liner act deliberately designed to provide long term government support to scheduled cargo liner service on essential foreign trade routes, to the exclusion of U. S. flag foreign trade tramps, dry bulk, and tankers. (Domestic trades also were not supported but they were already restricted to U. S. flag ships). In 1936 a U. S. flag non-liner fleet was practically non-existent, and none was considered necessary. In a 1937 report, "Economic Survey of the American Merchant Marine", the Maritime Commission noting that heavy subsidies would be required for a U. S. tramp fleet to compete concluded,

"There is no demand for the American Government to subsidize tramp shipping, and there is really no good reason why it should attempt to do so."¹

3. The third principle of the Act, and a continuing one since the Civil War, is that the U. S. shipbuilding industry is tied to the U. S. merchant marine and through it to government support. Vessels registered in the U. S. must be built in U. S. shipyards and U. S. registry is in turn a requirement for the receipt of government subsidy and for operation in domestic trade. Because it does not compete for construction of foreign ships the size of the U. S. shipbuilding industry is determined to a substantial degree by the size, age and prosperity of the U. S. flag fleet, which in turn is determined by the subsidies it receives from and the restrictions placed upon it by the Federal Government.

The initial effect of the Act was the start in 1937 of a 50 ship per year, 10 year merchant construction program, and by December, 1941, 150 ships had been completed or were under construction in U. S. shipyards. The provisions of

¹Committee of American Steamship Lines, Progress of the U. S. Liner Fleet under the Merchant Marine Act, 1936 (Washington, D. C.: Committee of American Steamship Lines, 1964), p. 19.

the Act were suspended during World War II in which time (1942-1945) U. S. private shipyards delivered 4915 steel self-propelled merchant vessels totalling 37 million gross tons.¹ Following the war the Government was again concerned with the transfer of war built ships both to U. S. citizens and to help rebuild foreign merchant fleets. Under the Merchant Ships Sales Act of 1946, 843 merchant ships were sold between 1946 and 1951 to U. S. citizens for U. S. flag operations at one fourth to one-fifth their replacement cost and additional ships were sold to foreign interests.² The Act did one other thing, it recognized as a matter of policy the specific need for an efficient U. S. shipbuilding industry by including in its policy statement that the U. S. merchant marine was to be "supplemented by efficient American-owned facilities for shipbuilding and ship repair, . . .".³ (This wording has subsequently been incorporated into the Merchant Marine Act, 1936 by the Merchant Marine Act of 1970.) No action was taken however to develop a specific program towards private shipyards or to promote stable shipyard employment

¹Little, Ship Construction Subsidies, pp. 40 and 60-61.

²Joint Economic Committee, Subsidy and Subsidy-Effect Programs (1965), p. 53.

³Merchant Ship Sales Act of 1946.

until 1951 when as a national defense measure the Government contracted directly with private shipyards for the construction of 35, 20 knot Mariner Class dry cargo vessels. They were eventually sold to private ship operators or converted to naval auxiliaries.¹

In 1954, the recognition that a program had to be developed for replacement of the U. S. flag war built fleet resulted in a full review of maritime subsidy policy by the Maritime Administration. The major conclusions and recommendations in the review report were:

1. The parity concept is sound.

2. It is essential for development of the merchant marine that the maximum amount of private capital be made available.

3. Congress should authorize the sale of government held ship mortgages and establish a construction revolving fund to replace the uncertain annual appropriation of construction funds.

4. A construction program of 60 ships per year is sufficient to maintain a shipyard mobilization base of 36,000 shipyard production workers.

5. U. S. flag tramp shipping requires economic aid to survive.

¹Little, Ship Construction Subsidies, p. 45.

6. Because the indeterminacies involved in the calculation of the construction differential subsidy (CDS) complicate the subsidy negotiations, CDS should be determined for major types of ships rather than for individual ships.¹

The result was the inauguration of the largest ship construction program in our peacetime history. The program included constructing tankers under trade-in and Navy charter programs, the repair and modernization of 200 ships in the National Defense Reserve Fleet, and development of replacement plans for the subsidized U. S. flag foreign trade fleet.² The construction programs were aided by the following legislation, amending the Merchant Marine Act, 1936, which although not incorporating all the recommendations of 1954 report did provide additional government assistance to the maritime industry:

1. 1954 - Congress enacted a permanent cargo preference statute (P.L. 83-664) reserving 50 per cent of government cargoes to U. S. flag ships, primarily to the benefit of U. S. flag tramp operators.

¹MARAD, Annual Report FY 1954, p. 1.

²Ibid., p. 2.

2. 1954 - A continuation of legislation enacted in 1952 reducing the minimum age of ships traded-in for credit towards new construction from 17 years to 12 years thereby making most of World War II construction available for immediate replacement.¹

3. 1956 - Government mortgage insurance aid was authorized (P.L. 83-781) to supplement the direct government mortgages provided by the 1936 Act. This gave impetus to private financing and freed ship mortgages from dependency upon annual Federal appropriations.²

4. 1960 - A Ship Exchange Program (P.L. 86-575) was enacted, primarily to the benefit of non-subsidized operators, authorizing the exchange of privately owned U. S. war built ships for more modern or efficient war built ships owned by the U. S. Government.³

In 1957 the Maritime Administration claimed in its fiscal year 1956 annual report that they had "achieved a planned shipbuilding program adequate to meet the country's immediate and future requirements."⁴ At that time there were

¹Little, Ship Construction Subsidies, p. 52.

²MARAD, Annual Report FY 1955, p. 2.

³MARAD, Annual Report FY 1970, p. 14.

⁴MARAD, Annual Report FY 1956, p. 1.

68 ships on order, or under construction, conversion, or reconditioning. New operating differential subsidy contracts had been negotiated with subsidized operators to replace (dependent upon the availability of construction subsidy funds from Congress) 82 ships in the period 1957-1970 and negotiations were in progress for 105 additional ships in the same period.¹ In later years they were not so optimistic and in the fiscal year 1958 and 1959 reports only claimed to have made "progress to achieve" an adequate shipbuilding program.

As the years passed the need for change in U. S. maritime policy became increasingly apparent. Several studies and Congressional hearings were conducted in the period 1964 to 1967, but the real impetus for change was the condition of the maritime industry itself.

1. Between 1958 and 1967 the U. S. flag share of our foreign trade was reduced from 12.2 per cent to 5.3 per cent and the actual tonnage carried was reduced by 1/3. It was estimated that by 1980, if no new ships were constructed, the U. S. foreign trade fleet would be reduced to 200 ships, capable of handling 3 per cent of U. S. foreign trade.²

¹Ibid., pp. 1-3.

²MARAD, Annual Report FY 1970, pp. 1 and 27.

2. The subsidized liner replacement program was failing to meet its goals because of limitations on government construction funds and the financial inability of some operators to meet their replacement obligations. The latter was effected by the risks associated with their ability to attract additional cargo in the future and earn a satisfactory rate of return on the large capital expenditures required. In 1964 the total program was for 295 ships by 1975. This was estimated to require an operators investment of \$1,946 million, with 216 ships requiring \$1.248 million to be contracted by 1967.¹ Through fiscal year 1967 however only 155 ships and \$0.891 million of operators funds had been committed to contract.²

3. The unsubsidized foreign trade dry cargo fleet continued to deteriorate. Provisions of the Long Range Shipping Act of 1952 which permitted the use of construction subsidy aid to bulk carriers was not utilized, in spite of a large number of applications (30 pending at the end of FY 1967; 14 for subsidized operators and 16 for unsubsidized operators) for such aid, ". . . pending a policy determination on subsidy

¹CASL, U. S. Liner Fleet, p. 18.

²MARAD, Annual Report FY 1970, p. 22.

aid for vessels other than replacement ships for subsidized operators."¹

4. Major private shipyard employment on MARAD construction projects had dropped in 1966 and 1967 to 6,000 production employees per day from the 1962 high of 14,000 men per day.²

Probably more basic than the above were the lack of precise policy objectives against which the system designed to foster the maritime policy could be judged. The 1936 Act stipulates that a merchant marine is necessary for both commercial and national defense purposes. The measure of the former is its ability to carry a "substantial portion" of waterborne foreign trade, and that of the latter is its ability to serve as a naval auxiliary. "Substantial portion" was never defined and although the loss of U. S. flag carryings was decried a policy target was never set.

Likewise with national defense nowhere were the merchant marine and shipbuilding capabilities explicitly stated. There is no true commercial need for a shipbuilding industry in the U. S. as the peacetime demand for ships can be met by ships built in foreign shipyards. The construction subsidy was

¹MARAD, Annual Report FY 1967, pp. 19-20.

²Seapower Subcommittee, Status of Shipyards, p. 10655.

looked upon as not only providing ships, but primarily as providing additional capacity to build ships because our wartime shipping needs have always exceeded our peacetime needs. One attempt to define a national defense policy was MARAD's 1954 recommendation of a 60 ship per year construction program which would also employ the minimum recommended defense nucleus of 36,000 production employees. This nucleus, based upon a World War II type conflict, was never seriously considered by Congress. Another attempt was made by the 1965 Interagency Task Force on Maritime Policy in their proposal that the Government buy no more of a subsidized activity than required to meet non-economic (in this case national defense) needs. They recommended an annual construction subsidy calculated to provide the private shipbuilding capacity necessary to meet national defense needs only. If U. S. flag operators had commercial needs for ships beyond that capacity they could build them in foreign yards with no subsidy. While they did not explicitly state what the national defense objectives should be they did project a 20 year, 21 ship per year (17 of which were to be subsidized) construction program in U. S. shipyards employing 14,700 production workers.¹ While some

¹U. S. Department of Commerce, The Merchant Marine in National Defense and Trade - A Policy and a Program, Report of the Interagency Maritime Task Force (Washington, D. C.: U. S. Department of Commerce, 1965), pp. 2-6 and Exhibit II.

other recommendations of the Task Force were included in the Merchant Marine Act of 1970, the one to set a national defense objective for shipbuilding was not.

In the absence of definite commercial and national defense objectives the achievement of parity became the primary object of Federal maritime policy. It also provided the yardstick against which the success or failure of government policy was measured. Ship operators and shipyards insisted that subsidies must provide parity for the program to be a success and others measured the program's failure by the subsidy percentages necessary to attain parity.

Merchant Marine Act of 1970

The resulting government action was a major revision to the 1936 Act which is so broad as to be labeled the Merchant Marine Act of 1970. Proposed to Congress by President Nixon on October 23, 1969, the Act passed both the House and Senate with one lone dissent each and was signed into law (P.L. 91-469) on October 21, 1970. The principle provisions of the Act are as follows. They will be analyzed in greater detail in subsequent chapters.¹

¹Merchant Marine Act of 1970, Public Law 91-469.

1. A declaration of national policy that " . . . there should be authorized and appropriated for fiscal years 1971 through 1980 such sums as may be necessary to construct 300 ships . . .".¹

2. The construction program features standardized ship designs, multi-year procurement contracts to facilitate series construction, payment of construction subsidies direct to shipyards, and permits negotiated contracts between shipyards and operators. Since these measures are expected to lower production costs the Act set construction subsidy limits of 50 per cent after June 30, 1970, 45 per cent in fiscal year 1971, and subsequent reductions to a 35 per cent ceiling in fiscal year 1976.

3. The establishment of a Commission on American Shipbuilding to review the progress of the shipyards in meeting the 1976 construction subsidy goal, to recommend alternatives to the program if it finds that the 1976 target cannot be met, and to recommend actions by the Government and industry to improve the competitive position of the industry in the world shipbuilding market. The Commission's report is due in 1973 except that if the Secretary of Commerce enters into a contract requiring a construction subsidy higher than the

¹Ibid., SEC. 2.

then current ceiling, the Commission's report is due within six months of that event.

4. Expansion of construction aids. The mortgage guarantee program is expanded and tax-deferred construction reserve funds are extended to unsubsidized foreign trade and noncontiguous domestic trade operators.

5. The extension of construction and operating subsidies to bulk carriers in foreign trade which should " . . . eventually lead to elimination of premium freight rates paid for the transportation of government-sponsored cargoes."¹

6. A restructuring of seafaring wage subsidies which ties them to a national wage index rather than negotiated industry wage agreements.

The goals of the new maritime program are to provide a foreign trade merchant fleet in 1980 of 583 ships. The fleet is expected to have the same carrying capacity as did our 1969 fleet of 942 ships. Because the construction program emphasizes highly productive ships (container, barge/lighter carrying, tankers, dry bulk, and combination oil/bulk/ore), and because MARAD has started a priority program of market development for U. S. ships, the fleet is projected to carry

¹ MARAD, Annual Report FY 1970, p. 4.

about 15 per cent of our 1980 foreign trade tonnage. It is anticipated by MARAD that over 56 per cent of the 1980 fleet will be less than 10 years old, and less than 7 per cent will be over 20 years old.¹

The 1970 provisions strengthen, modify, and expand the concepts of the original 1936 Act. First the concept of parity through direct subsidies is strengthened by the decision to subsidize bulk carriers and to phase out the indirect subsidy provisions of cargo preference rate differentials. Second the Act is no longer a liner act committed to maintain service on selected routes, but is an expanded foreign trade fleet act with a long range (10 year) commitment of new construction ships and expanded trade carryings. Third U. S. shipbuilders are for the first time made equal partners with the merchant marine in the considerations provided under the Act. The long range building program as described by President Nixon in his proposal to Congress was intended to encourage builders to standardize ship designs and introduce the mass production techniques which have kept other U. S. industries competitive. Unlike the merchant marine however, the ship-builder incentives contain a threat ("challenge" in the words of the President). In describing the reducing scale of

¹Dept. of Commerce, U. S. Industrial Outlook 1971, pp. 380-81.

construction subsidies required by the Act the President stated;

We are confident that the shipbuilding industry can meet this challenge. If the challenge is not met, however, then the Administration's commitment to this part of our program will not be continued.¹

The President's threat to the shipbuilding industry had been made clear just a few weeks prior to his statement, when Jack W. Carlson, Assistant Director of the Bureau of the Budget for Program Evaluation listed the "Construction of Merchant Ships Abroad" among 70 major policy issues under review for fiscal year 1971.²

Summary

U. S. maritime policy has been developed on the basis of protectionism and maintenance of cost parity with foreign competitors. The protectionist aspects restrict U. S. registry to U. S. built ships and specify U. S. registry as a requirement to engage in certain U. S. trades. Cost parity is achieved through direct government subsidy of ship operating

¹U. S. President, "Message to Congress on the United States Merchant Marine, Oct. 20, 1969," United States Naval Institute Proceedings, XCVI, No. 5/807 (1970), 354.

²U. S. Congress, Joint Economic Committee, Economic Analysis and the Efficiency of Government, Hearings, before the Subcommittee on Economy in Government, 91st Cong., 1st sess., 1970, p. 695.

and construction costs. Its purpose has been to develop and maintain a merchant marine adequate for both commercial and national defense needs, and more recently (since 1946) to supplement the merchant marine with an efficient shipbuilding and repair industry.

In practice Federal policy has failed to explicitly state commercial and national defense objectives for the merchant marine and the shipbuilding industry. The merchant marine has experienced large expansion during wartime followed by peacetime periods of declining size, cargo carryings, and prosperity. Government peacetime subsidy programs have primarily benefited only the subsidized liner segment of the fleet. Likewise the merchant shipbuilding industry has built the major share of its ships as the result of wartime programs. In peacetime it has been dependent upon the size, age, prosperity, and degree of government support provided to the U. S. merchant marine.

The Merchant Marine Act of 1970 has for the first time set national policy goals for peacetime construction and employment of the merchant marine. Subsidy support is expanded to include all segments of the foreign trade fleet and it is designed to make the shipbuilding industry a co-equal partner with the merchant marine.

III. FEDERAL GOVERNMENT MARITIME SUBSIDIES

Introduction

Federal maritime policy has provided substantial support of the U. S. shipping and shipbuilding industries primarily through the Merchant Marine Act, 1936 as amended. This support is in the form of direct and indirect subsidies, preferences, loans and loan guarantees, special provisions in the tax structure, and cabotage laws.

Federal funding for maritime programs is a single line item "Merchant marine aids" within the Federal Budget Water Transportation Section of the Commerce and Transportation Programs. The Merchant marine aids appropriation is further divided into its elements under the Ocean Shipping-Maritime Administration classification in the Budget and Appendix to the Budget. Although the above functional budget classification is ostensibly designed to arrange Federal programs by "mutually exclusive categories according to their principle purpose, regardless of the agency administering the program,"¹ a number

¹U. S. Bureau of the Budget, The Budget of the United States Government Fiscal Year 1971 (Washington, D. C.: Government Printing Office, 1970), p. 74. (Subsequent Budget references are identified by Fiscal Year only).

of maritime subsidy programs are either fractioned between other agencies or not identified in the Budget or in the Federal appropriation process.¹

Because of this the total cost and effect of subsidy programs for the maritime industry are difficult to identify. In testimony before the Joint Economic Committee former Budget Director Charles Schultze stated the direct and indirect costs to be \$500 million per year.² In the same hearings Prof. Leonard A. Rapping of Carnegie - Mellon Institute, and a co-author of a 1961 study to determine the economic value of the merchant marine,³ estimated the total maritime subsidy in fiscal year 1965 to be at least \$550 million.⁴ The subsidy program of the Maritime Administration Ocean Shipping Budget, however, total only 60 per cent of these estimates.

¹Ibid., p. 116 and pp. 281-283.

²Joint Economic Committee, Economic Analysis and the Efficiency of Government, Hearings, p. 794.

³Allen R. Ferguson, et al., The Economic Value of the United States Merchant Marine (Evanston, Ill.: Northwestern University Press, 1961).

⁴Joint Economic Committee, Economic Analysis and the Efficiency of Government, Hearings, p. 476.

Subsidy Programs

A break down of the various subsidy programs is contained in Table 3. Each is classified as to function, administrating agency, whether identified in the Ocean Shipping Budget, and appropriate section of the Merchant Marine Act, 1936.

Major areas not considered are the benefits to the U. S. maritime industry resulting from the substantial Federal funding of harbor improvements, canals, dredging of rivers, charting of waters, and placement and maintenance of navigational aids. Also, as will be developed later, the subsidy effects of U. S. military shipments and military aid shipments are not considered. In addition one could take the position that the entire MARAD Budget is a subsidy in support of the maritime industry. Such an approach would equate with labeling the Department of Commerce expenditures as a subsidy to U. S. business. The approach here is however to limit the extent of subsidies considered to only those having a direct effect on the maritime industry and within the Joint Economic Committee definition.

Two subsidies, school assistance and medical benefits, will not be discussed further. Both assist in providing a trained citizen merchant marine but their effects on merchant

TABLE 3

MARITIME SUBSIDY PROGRAMS

FUNCTION	ADMINISTERING AGENCY	IDENTIFIED IN OCEAN SHIPPING BUDGET	M.M. ACT 1936
1. Operating- Differential Subsidy	MARAD	Yes	TITLE VI
2. Construction Aids			
a. Construction- Differential Subsidy	MARAD	Yes	TITLE V
b. Trade-in Allowance	MARAD	Yes	SEC 510
c. Loan/Mortgage Aid	MARAD	Yes	TITLE XI
d. Special Tax Provisions	MARAD	No	TITLE VI
e. Government Construction	MARAD	Yes	TITLE VII
3. Other Subsidies			
a. Cargo Preference	VARIOUS	No	SEC 901 and other
b. Ship Exchange	MARAD	No	SEC 510
c. War Risk Insurance	MARAD	Yes	TITLE XII
d. Cabotage	Not App.	No	-----
e. School Assistance	MARAD	Yes	SEC 216 and other
f. Medical Benefits	Pub. Health Svc.	No	-----

ship construction are remote. The former subsidy operates the U. S. Merchant Marine Academy and provides Federal assistance to five state maritime schools under section 216 of the Merchant Marine Act, 1936 and the Maritime Academy Act of 1958 respectively. Together these schools graduate approximately 620 licensed deck and engine officers per year. The fiscal year 1972 appropriation for school assistance was \$9.5 million.¹ Under the medical benefits subsidy officers and men of the merchant marine are provided free medical treatment in U. S. Public Health Service hospitals. This subsidy is not identified separately in the Budget.

Operating-Differential Subsidy (ODS)

The operating-differential subsidy (ODS) is the largest single maritime subsidy program in terms of dollars. The cost of this program is appropriated annually under the ODS classification in multi-year funds. In FY 1972 the administrative cost of the program was funded separately as an annual appropriation called "operating aids" under the MARAD salaries and expenses budget.² In the years just

¹ FY 1972 Budget Appendix, pp. 275-77.

² FY 1972 Budget Appendix, pp. 273-75.

prior to FY 1972 this cost was not identifiable as it was included under the general administrative expense classification. When quoting ODS expenditures, such as in their annual report, MARAD does not include the administrative expense of the program.

ODS is intended to compensate U. S. operators for the difference between the U. S. flag costs and the cost of operating a similar vessel in the same service under competitive foreign flags. Prior to the Merchant Marine Act of 1970 subsidy payments were made for the difference in the cost of wages, subsistence of officers and crew, maintenance, repairs, and insurance. To be eligible for subsidy payments an operator had to serve an essential foreign trade route; offer regularly scheduled cargoliner service (dry and liquid bulk carriers not eligible); operate vessels constructed in the U. S., repaired in the U. S. (except for emergencies), and manned by U. S. citizens; agree to replace subsidized vessels with ones built in U. S. shipyards and establish statutory reserve funds for this purpose (see Special Tax Provisions). Until 1970 a subsidy recapture provision existed which returned to the Government 50 per cent of earned profits in excess of 10 per cent of "capital necessarily employed."¹

¹Ferguson, The Economic Value of the U. S. Merchant Marine, pp. 41-45.

These provisions were modified by the Merchant Marine Act of 1970 which extended coverage to operators of bulk carriers engaged in foreign trade, restricted ODS subsidies to differentials in wage and insurance costs, tied the allowable wage escalation to a national wage index, and eliminated the recapture provision.¹ The escalation provision is important because heretofore the Government was required to include the costs of any increased operating expenses resulting from collective bargaining agreements in the wage costs eligible for ODS. The Government in effect paid at least 70 per cent of all wage increases and the incentive for subsidized operators to hold down wage increases in union bargaining was lessened.²

There are presently thirteen operators participating in ODS with a total of 247 ships under contract. The impact of ODS payments to these operators is evident from the subsidized operators condensed income statements compiled by MARAD. For calendar years 1968-1969 ODS payments totaled

¹MARAD, Annual Report FY 1970, p. 4.

²Based on 1965 data for fifteen subsidized operators which shows that the wage subsidy (including fringe benefits) amounted to 73 per cent of wage costs. Ernst and Ernst, U. S. Maritime Industry Economic and Financial Data, Report prepared for Long Range Objectives Group Office of Chief of Naval Operations, Navy Dept., (Washington, D. C.: Defense Documentation Center, 1967), p. 52.

45.7 per cent and 48.8 per cent respectively of costs in the subsidizable categories; in terms of total voyage expenses ODS was 21.7 and 23.7 per cent respectively.^{1,2} The total ODS expenditures in recent years are contained in Table 4. The additional administrative costs are only known from the FY 1972 budget request, but can be assumed constant over recent years at \$3.65 million.³

Two provisions of the 1970 Act should be more fully explained as they effect the financial condition of the subsidized operators. First the Government allowance of seafaring employee wage increases has not been a one way street. Wage costs have been subject to MARAD review and after the fact disallowance for subsidy as not being "fair and reasonable". This procedure with its Subsidy Board hearings and appeals resulted in a large backlog of pending ODS rate decisions. The extent of these in 1970 was such that the Board reached agreement with most operators to extend the 1965 subsidy rates through calendar 1968 in order to concentrate on 1969 and subsequent years. The wage index

¹MARAD, Annual Report FY 1970, p. 73.

²MARAD, Annual Report FY 1969, p. 78.

³Calculated average for FY 1970-1972 from, U. S. Budget Appendix FY 1972, p. 275.

TABLE 4

OPERATING-DIFFERENTIAL SUBSIDY
AND
CONSTRUCTION DIFFERENTIAL SUBSIDY
EXPENDITURES

(in Thousands)

FISCAL YEAR	NEW CONSTRUCTION DIFFERENTIAL SUBSIDY	RECONSTRUCTION DIFFERENTIAL SUBSIDY	TOTAL CDS	OPERATING DIFFERENTIAL SUBSIDY
1970	74,999	21,723	96,723	205,732
1969	95,460	57	95,517	194,703
1968	97,611	97	97,707	200,130
1967	81,593	932	82,525	175,632
1966	70,811	2,572	73,383	186,628
1965	87,649	38	87,687	213,334
1964	77,234	1,665	78,900	203,037
1963	90,514	4,181	94,696	220,677
1962	136,858	4,161	141,019	181,919
1961	102,119	1,215	103,334	150,143
1960	69,157	4,828	73,985	152,756
1959	21,680	7,065	28,745	127,693
1958	22,638	4,709	27,347	120,032
1957	16,379	3,909	20,288	108,292
1956	1,614	14,369	15,982	135,342
Total	1,046,315	71,523	1,120,838	2,576,048

Source MARAD, Annual Report FY 1970, p. 22.

provision of the 1970 Act eliminates the retrospective review of wage costs which has been the major factor in subsidy disallowances. Subsidy litigations and allowable ship manning are also being reduced under a revision to Section 603 (c) which permits MARAD to set the number of officers and crew which will be allowed under subsidy prior to the award of the vessel's construction contract, and exempts MARAD from being bound by the manning and wage scales set by collective bargaining agreements. One tangible result of this provision is MARAD's announcement that whereas the manning scales for the initial group of 11 LASH ships were 38, subsequent vessels of this class will receive subsidy for 32.¹

Secondly the repeal of the subsidy recapture provision was on the basis that the 48 per cent corporate tax introduced subsequent to the 1936 Act accomplish the same purpose. The validity of this reasoning is evidenced by the fact that in the period 1958-1969 recapture accruals amounted to \$36.5 million or 1.6 per cent of the net (after recapture deducted) payable subsidy.²

¹MARAD, Annual Report FY 1970, pp. 4, 6, and 19.

²Ibid., pp. 4 and 69.

As discussed in Chapter II, MARAD in 1954 inaugurated a replacement program for the subsidized fleet. Prior to 1971 all new construction subsidy funds were allotted to this program. Operators receiving ODS were required to enter into contracts with the Government to replace their ships prior to the statutory age of 20 years; extended in 1960, to 25 years for ships built after 1946 by P.L. 86-518 in order to adjust the program to the financial capabilities of the operators.¹ The results in terms of ships constructed are discussed under construction-differential subsidy. The point to be made here is that Section 605 (b) of the Merchant Marine Act, 1936 permits continued payment of ODS to overage ships when it is found to be in the public interest. A measure of the ineffectiveness of ODS to encourage ship replacement (Ultimately dependent upon the financial position of the operators, the profit potential of new ships, and the amount of construction subsidy appropriated annually by the Government.) and thereby expend ODS funds in less productive ships is evident in the degree to which this waiver provision has been utilized. Table 5 is a compilation of the overage ships receiving ODS under waiver. As late as 1969, 28 per cent of the ships were

¹Little, Ship Construction Subsidies, p. 53.

TABLE 5

SHIPS RECEIVING
OPERATING-DIFFERENTIAL SUBSIDY
UNDER OVERAGE WAIVER

FISCAL YEAR	SHIPS OVERAGE OR TO BE REPLACED OVERAGE ^a	SUBSIDIZED SHIPS TOTAL	PERCENT OVERAGE ^b
1969	83	293	28
1968	109	303	36
1967	124	315	39
1966	128	318	40
1964	149	317	47
1962	138	298	46
1960	111	278	40
1958	91	305	30
Prior 1958	---	---	< 10

Source: MARAD, Annual Reports FY 1956-1970.

Notes:

^aIncludes those ships to be replaced one year or more later than statutory date.

^bOverage range for all years has been 1 to 10 years.

overage or scheduled to be replaced at least one year beyond the statutory age.

Construction Aids

Construction - Differential Subsidy (CDS)

Until the Merchant Marine Act of 1970 CDS was in practice applied only to the construction or reconstruction of passenger, passenger-cargo, and breakbulk dry cargo ships built for operators receiving ODS. While the Long Range Shipping Act of 1952 repealed a restriction requiring ships constructed with CDS to be operated on essential foreign trade routes and thereby made CDS available to any U. S. vessel in foreign commerce, this authority went unused and CDS funds have been expended solely for the subsidized lines (lines receiving ODS) fleet replacement program. The Merchant Marine Act of 1970 now extends CDS to ships built for unsubsidized foreign trade operators including dry bulk and tanker vessels.¹

Under CDS the Government pays the difference between the U. S. shipyard cost and a "fair and reasonable" estimate of cost of constructing the ship in a foreign shipyard.² Since foreign shipyards do not bid for subsidized construction,

¹MARAD, Annual Report FY 1970, p. 3.

²Merchant Marine Act, 1936, Sect. 502 (b).

their bid must be simulated through MARAD computed estimates. Because the ship is never built in a foreign shipyard there is no way of testing the accuracy of the estimate. On occasion MARAD has purchased foreign bids for similar type ships but even these must be corrected for price level changes, ship design differences, and regulatory differences in construction standards. Despite the inability to measure the system's accuracy it has been accepted by all parties (operators, administrators, Congress and auditors) as satisfying the legislative intent of the subsidy.¹

Heretofore an individual subsidy determination was made for each vessel or contract, but under the 1970 Act MARAD is authorized to compute the CDS rate on the estimated costs for a type of vessel. Based on this provision MARAD has proposed determining for each type of vessel the estimated domestic and foreign costs for a vessel design which is representative of the type and then applying the CDS rate derived from these two estimates to the domestic price of any vessel of that type to be constructed. An example of the types considered are tankers, oil/bulk/ore carriers, dry bulk carriers, LASH (lighter carrier), SeaBee (barge carrier),

¹Little, Ship Construction Subsidies, p. 7.

containerships, LNG carriers (liquid natural gas), and one type for reconstruction of breakbulk cargo ships to containerships. Depending upon the range of sizes in a type, the type may also be subdivided into size groups.¹ This procedure not only simplifies the CDS determination but also provides the ship operators and shipyards with a subsidy planning figure that can be relied on.

In addition to CDS the Government pays the total cost of national-defense features (NDF) which are considered necessary by the Navy and considered to be in excess of commercial requirements by the Maritime Subsidy Board. The 1936 Act set the statutory limit for CDS at 50 per cent of the cost of the vessel (less NDF and special features paid for by the owner). In 1960 it was raised by Public Law 86-607 to 55 per cent because that was the expected rate necessary to maintain parity. The House report accompanying the bill stated that as the subsidized liner replacement program increased it was expected that the differential would again drop to 50 per cent.² As of June 30, 1970 the 1970 Act dropped the limit to 50 per cent and a target differential of

¹Maritime Administration, "Determination of Construction-Differential Subsidy by Type of Vessel," Federal Register, XXXVI, No. 80, April 24, 1971, 7751-7752.

²Little, Ship Construction Subsidies, p. 54.

45 per cent was set for FY 1971 with a two per cent decrease per year until 1976, when thereafter a 35 per cent rate shall apply.¹

Table 6 summarizes the subsidized postwar ship replacement program since its inception by Fiscal Year in which the contracts were awarded. Except for two oil/bulk/ore carriers awarded in FY 1971 (under the 1970 Act) all the ships in the replacement program have been for the shipping lines receiving ODS. The CDS rate of Table 6 is a gross rate calculated on the basis of total contract award and total CDS for a fiscal year, and not the average rate for the contracts awarded in that year. The gross rate provides a better measure of government support to the shipbuilding industry. For comparison purposes the CDS rates approved for contracts in FY 1969 and 1970 averaged 53.4 per cent and 45.8 per cent respectively.²

There have been two means for contracting the construction of a vessel with CDS. Under Section 504 of the Merchant Marine Act, 1936, both MARAD and an operator execute a contract with the lowest responsible bidding shipbuilder. The Government is responsible only for the CDS payment and the cost of

¹Merchant Marine Act, 1936, Sect. 502 (b).

²MARAD, Annual Report FY 1970, p. 5.

TABLE 6

SHIP REPLACEMENT PROGRAM^a
(\$ in Millions)

FISCAL YEAR (1)	SHIPS CONTRACTED (2)	CONTRACT AWARD ^b \$ (3)	OWNER'S SHARE \$ (4)	CDS \$ (5)	CDS RATE % (6)
1971	12	307.8	172.8	135.0	43.9
1970	5	109.0	58.4	49.8	45.8
1969	10	247.5	117.5	127.3	51.5
1968	12	250.5	124.6	124.8	49.9
1967	1	15.7	7.0	8.5	54.3
1966	17	254.4	117.7	133.0	52.7
1965	14	168.3	78.3	89.6	53.4
1964	15	156.0	71.7	84.0	54.0
1963	18	205.6	99.0	106.3	51.8
1962	13	128.9	65.1	63.4	49.3
1961	31	302.1	152.1	147.1	49.3
1960	13	170.3	87.4	81.5	48.2
1959	14	140.4	73.4	65.1	47.0
1958	15	166.9	87.4	77.9	47.0
1957	0	0	0	0	0
1956	4	94.9	55.6	38.6	41.0
TOTAL	194	2,718.3	1,368.2	1,331.9	----

Source: 1956 to 1970 data from MARAD, Annual Report FY 1970, p. 23. 1971 data from Shipbuilders Council of America, Shipyard Weekly, No. 26, July 1, 1971.

^a Figures are for original contract award only, and exclude escalation, changes, and engineering and outfitting budgets.

^b Contract award includes special features paid 100% by owner and national defense features which are not included in Columns (4) and (5).

national defense features. The operator in turn pays the balance usually 25 per cent down and the remainder with a 25-year government insured mortgage loan under Title XI of the Act. An alternative method under Section 502 permits the Government to contract directly with the low bidding shipyard for the full cost of the vessel and separately sell it to an operator for cost less CDS and national defense features. Because this method requires the Government to finance the entire cost of the vessel it is not used.

A provision of the Merchant Marine Act of 1970 (Sections 502 (a) and 504) permit MARAD to accept negotiated prices between shipyard and purchaser provided they are found to be fair and reasonable and within the target percentages of CDS. Section 501 also extends the eligibility of application for CDS to any U. S. shipyard. The intent of both provisions is to encourage shipyards to independently develop or participate in the development of standard ship designs which are value engineered for low production cost.

CDS is identified as a specific item in the ship construction budget. The cost of national-defense features (NDF) are included in the CDS total. NDF could be considered a national defense cost with the subsidy to the U. S. ship-building industry being only the difference between U. S.

costs and foreign costs for comparable features. Since NDF averaged only about one per cent of CDS in the period 1954-1970 it is not unreasonable to use the total CDS/NDF figure as subsidy cost.¹ CDS expenditures are summarized in Table 4. The amount expended for reconstruction of ships is only six per cent of the total and is in line with government policy that "financial aid shall be extended to reconstruction or reconditioning only in exceptional cases . . ."² Most of the conversions in this period have involved modification from breakbulk cargo to container capability. Administrative expenses associated with CDS have been located either within the ship construction budget or within the salaries and expenses budget. It is not included in MARAD's reports of CDS costs. A reasonable estimate for CDS administration is \$3.6 million per year.³

The total of CDS plus ODS is the usual figure quoted as the cost of the maritime subsidy programs.

Trade-in Allowance

The trade-in of a used ship to the Government in exchange for an allowance of credit to be applied against

¹Ibid., p. 23.

²Merchant Marine Act, 1936, Sect 501 (c).

³Estimated from ship construction administration figures given in FY 1969 and FY 1970 Budget Appendices.

the cost of a new U. S. built vessel is allowed by Section 510, Merchant Marine Act, 1936. The law calls for the allowance to be "the fair and reasonable value of such vessel".¹ In 1967 the trade-in allowance was reported to be the average of the domestic market and 90 per cent of the world market value. The domestic market price was also reported as having been higher than the world market since the end of 1960.² The traded in ships are either placed in the National Defense Reserve Fleet or sold.

Funds for acquisition of replaced ships are included as a line item in the ship construction budget. Since the Government does receive a ship in return for an allowance which is reported to be slightly less than the domestic market value of the ship there is no quantifiable subsidy. The Government's readiness to accept obsolete ships towards construction allowances is however a subsidy aid to the extent that it encourages ship replacement.

Loan/Mortgage Aid

Under Title XI of the Merchant Marine Act, 1936, MARAD is authorized to insure construction loans and mortgages not to exceed 87½ per cent of the actual cost of vessels meeting

¹Merchant Marine Act, 1936, Sect. 510 (d).

²Ernst, Economic and Financial Data, p. 64.

certain size, speed, or type criteria. (Mortgage insurance was also made available for barges and lighters to be carried aboard ship by the 1970 Act.) On ships not meeting these criteria and on those built under CDS the maximum is 75 per cent of the actual cost. These loan guarantees are also available for vessel reconstruction. At the end of FY 1970 \$919 million in mortgages were in force.¹ The current statutory limit on insured loans is \$3 billion; raised from \$1 billion by the 1970 Act.²

Government insurance is available to U. S. operators engaged in both foreign (subsidized and unsubsidized operators alike) and domestic trades. While the major portion of this assistance has gone to the subsidized foreign trade cargo operators ship replacement program, 22 per cent of the vessels covered by mortgage insurance on June 30, 1970 were tankers built without CDS and operated without ODS. Table 7 summarizes the results of the Federal Ship Mortgage Insurance Program (FSMI). Through June 30, 1970, 198 ships have been covered by FSMI of which 171 contracts are still in force.³

¹ MARAD, Annual Report FY 1970, p. 24.

² Merchant Marine Act, 1936, Sect. 1103 (e).

³ MARAD, Annual Report FY 1970, p. 24.

TABLE 7

FEDERAL SHIP MORTGAGE
INSURANCE PROGRAM
(\$ in Millions)

END OF FISCAL	TOTAL APPROVED APPLICATIONS AND CONTRACTS IN FORCE		
	\$ ^a	SHIPS	LIGHTERS
1970	919.4	171	360
1969	751.6	144	360
1968	651.6	129	---
1967	562.1	113	---
1966	485.2	98	---
1965	421.6	79	---
1964	454.5	82	---
1963	431.2	70	---
1962	458.9	67	---
1961	464.1	64	---
1960	449.0	53	---
1959	257.1	34	---
1958	219.1	26	---
1957	35.1	11	---
1956	11.4	4	---
1955	2.2	4	---

Source: MARAD, Annual Reports FY 1955, 1956, 1957 and 1970.

^a Principal and interest.

Insurance of these loans by the Government enables operators to obtain loans at more favorable interest rates than would otherwise be possible. In mid-1965 to mid-1966 loans to subsidized operators was reported to have been at an interest rate of approximately 5 per cent. The operator also pays an insurance premium to the Government of $\frac{1}{4}$ to $\frac{1}{2}$ per cent.¹

The Federal Ship Mortgage Insurance program (FSMI) is operated as a public enterprise fund. The redemption of defaulted loans or mortgages is financed from insurance premiums, interest earned on government securities held by the fund, and amounts which the Secretary of Commerce is authorized to borrow from the Treasury. The cost of administering the fund is included in the operating aids expense discussed under ODS.² The cost to the Government is small so long as there are no defaults. Since the start of the program only 4 per cent of the contracts have defaulted, the fund has not had to borrow from the Treasury since 1961, and the fund now has a retained income of over \$25 million.³

¹Ernst, Economic and Financial Data, pp. 63-64.

²FY 1972 Budget Appendix, p. 275-77.

³Based on summarized data from MARAD Annual Reports FY 1958 to FY 1970.

Section 509 of the Merchant Marine Act also allows for the construction of merchant vessels wherein the purchaser makes a down payment of $12\frac{1}{2}$ per cent plus pays the costs of a 25 year mortgage held by the Government. The mortgage interest rate was $3\frac{1}{2}$ per cent until changed to a rate commensurate with the average market yield on Treasury securities by the Merchant Marine Act, 1970. This direct mortgage aid has not been used since mid-1950.¹ In FY 1970 there were \$12.9 million in loans still outstanding and FY 1972 estimate was \$9.9 million.² The subsidy effect of these loans is the difference between the $3\frac{1}{2}$ per cent interest rate and the higher market rate which the Treasury must pay to finance the public debt. The gross effect of all such interest subsidies are already included in the budget as the interest on the public debt is higher than it would be if the interest income equaled the cost to the Treasury of capital tied up in outstanding loans. Assuming a Treasury borrowing rate of $4\frac{1}{2}$ per cent, and a loan maturity in 10 years the current interest

¹Lawrence, U. S. Shipping Policies, p. 169.

²FY 1972 Budget Appendix, p. 277.

subsidy on ship construction loans is less than \$0.5 million per year.¹

Special Tax Provisions

There are a number of special tax deductions, exclusions, credits, exemptions, and preferential rates designed into the Federal tax structure. Most of these provisions serve the same purpose as direct Federal expenditures, Federal loans, or Federal guarantees of private loans. They are in effect tax expenditures. They are however not listed in the Federal Budget as line item revenue losses or expenditures of tax money foregone for a specific purpose. Generally they are not considered by the Federal agencies and Congress during the annual budget reviews.² Examples applicable to industry are investment credits, capital gains on corporate income tax, and excess depreciation allowances.

The tax provision peculiar to the merchant marine is in the form of an indefinite deferral of income tax for

¹President's Commission on Budget Concepts, "Problems in Implementing a Capital Budget for Loans" (staff paper) in Brookings, Budget Concepts for Economic Analysis (Washington, D. C.: Brookings, 1968), pp. 43-47.

²Joint Economic Committee, Economic Analysis and the Efficiency of Government, Hearings, supplementary statement of Asst. Secretary of Treasury Joseph W. Barr, 1970, p. 133.

income deposited in certain reserve funds. The 1936 Act established certain statutory reserve funds for ship operators holding ODS contracts. The purposes were to provide for the replacement and acquisition of ships, prompt payment of obligations to the Government, and continued maintenance and operation of subsidized ships. Operators are required to deposit into the reserve funds; depreciation accruals on subsidized vessels; net proceeds of insurance, indemnities from total loss, proceeds from sale or other disposition of subsidized vessels including trade-in allowances paid by the Government; net profits from subsidized operations in excess of 10% capital necessarily employed; income earned on securities held in the funds; and voluntary deposits (which may be made with MARAD approval).^{1,2}

Funds may be withdrawn from the reserves only for the purpose of ship construction, reconstruction and ship mortgage loan payments of subsidized ships. Withdrawals

¹Ferguson, The Economic Value of the United States Merchant Marine, pp. 63-65.

²The reserve funds have been consolidated into one "capital construction fund" and extended to include all U. S. flag operators in foreign trade or noncontiguous domestic trade by the Merchant Marine Act of 1970. This change has yet to make a noticeable effect. Merchant Marine Act, 1936, Sect. 607.

for other purposes or upon termination of the operating subsidy contract are taxable. Investment of reserve funds in securities and common stocks (up to a statutory limit) are not considered withdrawals.

The indefinite deferral of taxes on the reserve funds has a net effect similar to an interest free loan. The Government allows the ship owner to have the use of the taxes it owes so long as it is to be used at some future date for ship construction. It is just as if the ship owner had paid his tax and then borrowed a like amount from the Government interest free for use towards ship construction.¹ Thus the tax deferrals are a form of ship construction subsidy not appropriated by Congress.

The costs of the tax deferral subsidy are difficult to determine because the tax provisions of Section 607 of the Merchant Marine Act, 1936 (Prior to the revision incorporated in the Merchant Marine Act, 1970) were not drafted in tax language. In administering the tax deferral provisions of the reserve funds the Internal Revenue Service has had to enter into interpretive contracts with each firm. Therefore

¹U. S., Congress, House, Committee on Merchant Marine and Fisheries, Merchant Marine Act of 1970, Hearings, before the Sub-Committee on Merchant Marine. Statement of Thomas F. Field on HR 15424, 91st Cong., 1st sess., 1970, p. 797.

the provisions may apply in different ways to different firms.¹

As of June 30, 1970 the combined total of the reserve funds was in excess of \$95 million and as of December 31, 1969 the retained earnings on which taxes have been deferred amount to in excess of \$633.7 million.² The subsidy cost of the interest free deferral was estimated at \$9 million per year for the period 1958-1962 by Lawrence,³ and more recently in 1968 at \$10 million per year by the U. S. Treasury.⁴

There is one other reserve fund; it is the voluntary construction reserve fund under Section 511 of the Merchant Marine Act, 1936. This fund open to all operators has been little used because there is no tax advantage.⁵

¹ Ibid., p. 798.

² MARAD, Annual Report 1970, pp. 74 & 77.

³ Lawrence, U. S. Shipping Policies, p. 209.

⁴ U. S. Treasury Department "The Tax Expenditure Budget: A Conceptual Analysis," Secretary of Treasury Annual Report FY-1968 (Washington, D. C.: Government Printing Office, 1969), pp. 334-35.

⁵ U. S. Department of Commerce, Maritime Administration, A Review of Direct and Indirect Types of Maritime Subsidies with Special Reference to Cargo Preference Aid, (Washington, D. C.: Government Printing Office, 1956), pp. 8-9.

Government Construction

Under Title VII of the Merchant Marine Act, 1936 MARAD is authorized to have constructed or reconditioned in U. S. shipyards (including navy yards if satisfactory contracts cannot be made with private yards) such new vessels as it determines necessary to carry out the objectives of creating a merchant marine adequate for essential foreign trade commerce. Such action must be based upon a finding, approved by the President that the objectives of the Act cannot be met by the provisions of Titles V(CDS) and VI(ODS). The vessels are to be sold or chartered to private operators; or where necessary operated for MARAD by private operators.¹ Title VII has been applied to merchant ships in only two instances;

1. In 1951 the construction of 35 Mariner Class (12500 tons, 20 knot) dry cargo vessels was authorized as a national defense measure. At the time of construction there was no operator interest in these larger high speed vessels but 29 were eventually sold to private operators. Most were sold after MARAD in 1956 set a price of \$4.4-4.9 million per ship as compared to the estimated cost of \$8.4 million each.²

¹Merchant Marine Act, 1936, Sections 210, and 701-704.

²Wytze Gorter, United States Shipping Policy (New York: Harper and Brothers, 1956), p. 55.

MARAD itself lists the total CDS equivalent of the Mariner Program at \$105.9 million or over \$3.6 million per ship sold.¹

2. In 1954 MARAD initiated an emergency ship repair program to upgrade more than 200 ships of the NDRF under PL 83-608, again as a national defense measure. Through fiscal year 1956 only 150 ships were repaired and modernized (at least 90 of which were Navy auxiliaries) at a cost of \$16.7 million.² Much of this work was done in other than the major private shipyards.

The Merchant Marine Act, 1970, by adding the "creation and maintenance of efficient shipyards and repair capacity..."³ in the U. S. as an objective of merchant marine policy, makes Title VII ship construction applicable as a means to further that objective. However since a basic intent of the 1970 Act is to encourage greater private investment and initiative there is no possibility that Title VII will be used short of a national defense crisis.

¹ MARAD, Annual Report FY 1970, p. 22.

² MARAD, Annual Report FY 1955, p. 2; MARAD, Annual Report FY 1956, p. 2.

³ Merchant Marine Act of 1970, Sec. 3.

Other Subsidies

Cargo Preference Aid

Cargo preference is the most important non-appropriated (non-appropriated in the sense that it is not a line item in the Budget document) subsidy aid to the U. S. Merchant Marine. In general it is legislation which requires at least 50 per cent participation by U. S. flag vessels in the transport of cargoes which would not exist except for their generation by U. S. Government purchases, loans, grants, payment guarantees, or acceptance of foreign currency.

The subsidy effect of the various cargo preference programs is the difference between the rate paid U. S. flag vessels under its protected share of the cargo and that which would be paid if the cargo were carried by a foreign vessel in the open market. This rate differential is generally higher for non-liner ships than for liner ships, since in the latter case shipping rates are generally set by international steamship conferences.

Aside from the indirect subsidy of higher cargo rates the effect of cargo preference programs on the U. S. flag merchant marine in terms of employment is appreciable. As indicated by Table 8 since 1960 Public Law 664 cargo alone has accounted for over 30 per cent of total U. S. flag

TABLE 8

U. S. FLAG CARRYINGS UNDER
PUBLIC LAW 664 PROGRAMS

(In thousands of long tons; 2, 240 lbs.)

CALENDAR YEAR	GOV'T SPONSORED CARGOES - TONS ^a	PL 664 CARGOES AS PER CENT OF TOTAL U. S. FLAG OCEANBORNE CARGOES ^b
1969	7565	36.6
1968	7566	30.3
1967	6480	31.6
1966	8651	33.0
1965	10478	37.8
1964	12023	39.4
1963	14119	49.5
1962	12992	43.9
1961	10920	41.6
1960	10255	33.1
1959	7345	27.1
1958	8487	27.5
1957	8116	16.0
1956	7012	13.0

^aU. S. Department of Commerce, Maritime Administration, Office of Market Development, All Agencies (Except Dept. of Defense) Summary of P.L. 664 Exports and Imports 1956-1969, (Mimeographed).

^bCalculated from: U. S. Department of Commerce, Maritime Administration, MARAD 1970, (Washington, D. C.: Government Printing Office, 1971), p. 27.

oceanborne carryings. For the non-liner dry cargo portion of the U. S. flag fleet the dependence on preference cargoes is much higher. In 1964 it was estimated to be 60 per cent of their carryings,¹ and in 1967, when preference cargoes were at their lowest because of Vietnam shipping requirements, it was 32 per cent of their carryings.² The principle legislative assistance in this area are:

1. Act of April 28, 1904 - This act applies to U. S. military cargoes and requires 100 per cent employment of U. S. flag vessels "to the extent that such vessels are available at reasonable rates."³ The premium rates accruing to U. S. flag vessels under this act can be attributed to a pure national defense requirement to assure an adequate U. S. flag fleet to meet military shipping requirements. The subsidy costs of this program should therefore be identified in the Budget under the national defense program, (It is not so identified in the Budget.) and therefore will not be considered in totalling the cost of the ocean shipping program. It is interesting to note however that there is no reliable method for calculating the premium rate subsidy

¹ Ernst, Economic and Financial Data, p. 68.

² Barker, Merchant Marine in National Perspective, p. 52.

³ MARAD, A Review of Direct and Indirect Types of Maritime Subsidies, (1956), p. 19.

resulting from military shipments. Lawrence has estimated that defense cargo contract rates have averaged 40-50 per cent above that obtainable in open competition and he estimates the total premium rate subsidy to be \$50 million per year for the pre-Vietnam period of 1954-1964.¹

The military shipping demand is highly variable and generally not one upon which a private shipowner can depend for employment (An exception to this is the small number of privately owned ships which have been built specifically for long term charter to the Military Sealift Command (MSC). The ships fill basic military needs and since they operate almost as an arm of the Government fleet will not be considered further.) Most of the U. S. tramp fleet and many U. S. liners were employed by MSC to carry military supplies during Fiscal Years 1966-1969. For example at the end of calendar 1968 MSC was employing 44 subsidized dry cargo ships, 116 unsubsidized dry cargo ships, and 51 tankers. In ship numbers this was 23 per cent of the privately owned U. S. flag ocean going fleet. Within 6 months however the need for commercial shipping had dropped to the extent that several tramp operators were fearing bankruptcy, preference cargo rates were at a low,

¹Lawrence, U. S. Shipping Policies, p. 208.

and subsidized and unsubsidized operators were arguing for preference in allocation of government cargoes.¹

2. Public Resolution 17, 63rd Congress - This resolution passed in 1934 as an intent of Congress states that all exports financed through government loans shall be carried in U. S. flag vessels to the extent that such ships are available at reasonable rates. This resolution was subsequently interpreted as not mandatory by the Attorney General, but as a guide to be followed where feasible subject to MARAD approval of waiver requests.² At present most of the exports under this provision are a result of U. S. Export-Import Bank loans. There is no available accounting of the premium rate subsidy paid to U. S. flag vessels under P.R. 17 through Export-Import loans. MARAD does estimate annually the total value of freight receipts accruing to U. S. flag vessels under these loans and from this data Table 9 estimates a conservative value for the premium rate subsidy for the years 1961-1970.

3. The Cargo Preference Act - In the period 1948-1954 Congress consistently enacted legislation requiring at least

¹MARAD, Annual Report FY 1969, pp. 6-7 and 66.

²MARAD, A Review of Direct and Indirect Types of Maritime Subsidies, (1956), p. 14.

TABLE 9

EXPORT-IMPORT BANK

P. R. 17 SHIPMENTS

(\$ in thousands)

CALENDAR YEAR	VALUE OF FREIGHT RECEIPTS BY U. S. FLAG VESSELS ^a	ESTIMATED SUBSIDY TO U. S. FLAG VESSELS ^b
1970	\$69,031	\$23,000
1969	55,291	18,400
1968	69,019	23,000
1967	51,871	17,300
1966	45,552	15,200
1965	36,201	12,100
1964	21,181	7,100
1963	29,618	9,900
1962	28,012	9,300
1961	18,999	6,300

^aU. S. Department of Commerce, Maritime Administration, Office of Market Development, Export-Import Bank P. R. 17 Shipments, Calendar Years 1961-1970, (Mimeographed.) Earlier data not available.

^bEstimate is based upon a U. S. flag differential of 50% above international rates, which assumes some cargo is carried by liners, at conference rates, and in small volume. This rate is the minimum reported in literature studied and is the lowest rate used by Lawrence, U. S. Shipping Policies, p. 364.

50 per cent of government sponsored economic and military aid cargoes be carried by U. S. flag vessels. Then in 1954 Congress passed a permanent cargo preference statute (P.L. 83-664) which amended the Merchant Marine Act, 1936 to require at least 50 per cent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) of U. S. Government sponsored cargoes (that resulting from Government purchases, grants, advances, credits or guarantees) be carried by U. S. flag commercial vessels to the extent they "are available at fair and reasonable rates for United States-flag commercial vessels."¹ This law has been the major source of the premium rate subsidy to the U. S. merchant marine. The annual P.L. 664 tonnage and its proportion to total U. S. flag ocean borne cargoes is shown in Table 8. Public Resolution 17 and military cargoes are not affected by this law.

The administration of shipments under this act are dispersed among the number of government agencies whose programs result in government sponsored cargoes. The largest program under P.L. 664 has been the Agriculture Department foreign assistance effort under Public Law 83-480. It has

¹Public Law 83-664 (The Cargo Preference Act) (1954) Merchant Marine Act, 1936, as amended, sect. 901. (b).

averaged annually some 50 per cent of all shipments under P.L. 664. The other major source of P.L. 664 cargo is the Agency for International Development (AID). It has averaged some 35 per cent of shipments. Sources of lesser importance have included the Inter-American Development Bank and General Services Administration.¹

The total subsidy effect of P.L. 664 is not known. The tonnage figures of Table 8 are even incomplete because Mutual Defense Assistance (MDA) cargoes, which are administered by the Department of Defense, are not included. While the House Committee on Merchant Marine and Fisheries in House Report 80 of the 84th Congress directed MARAD to exercise general surveillance over the administration of the law, their coordinating efforts have been basically ineffectual.² The Merchant Marine Act of 1970 has strengthened the position of MARAD and now requires each department to administer its program under regulations to be issued by the Secretary of Commerce.³ The results of this change are not evident as yet.

¹U. S. Department of Commerce, Maritime Administration, Office of Market Development, All Agencies (Except Dept. of Defense) Summary of P.L. 664 Exports and Imports 1956-1969, (Mimeographed).

²MARAD, Annual Report, 1970, p. 29.

³Merchant Marine Act, 1936, sect. 901 (b).

The only premium rate subsidy which is regularly recorded is that of Title I and IV shipments of P.L. 480 by the Commodity Credit Corporation (CCC) of the Department of Agriculture. In both these cases CCC pays direct to the U. S. carrier the differential between the U. S. flag rate and the international rate.¹ The total of this subsidy is shown in column (4) of Table 10. By using this known subsidy figure and by establishing a reasonable estimate for the U. S. flag rate differential from the published estimates summarized in Table 11 it is possible to calculate a conservative estimate of the differential rate subsidy for P.L. 664, column (5) of Table 10. Again it should be remembered that Dept. of Defense MDA cargoes are not included.

The effect of preference cargo has been basically to assure a measure of employment to the U. S. merchant marine and to underwrite the existence of unsubsidized liner and tramp/bulk operators through employment at higher than world shipping rates. The cargo preference statutes have none of the features of other subsidies of the Merchant Marine Act, 1936 which encourage and/or require ship replacement and modernization programs. Evidence of the result is;

¹Harbridge House, The Balance of Payments and the U. S. Merchant Marine (Boston: Harbridge House, 1968), pp. 56-57.

TABLE 10

ESTIMATED SUBSIDY FROM
RATE PREFERENCE PROGRAMS OF P.L. 664

(Tons in Thousands of Long Tons; dollars in millions)

CALENDAR YEAR	TOTAL CARGO PREFERENCE TONS ^a	AGRICULTURE PL 480 TITLE I AND IV-TONS ^a	INDIRECT SUBSIDY TITLE I & IV CARGOES ^b	EST. TOTAL SUBSIDY FOR ALL PL 664 CARGOES ^c
(1)	(2)	(3)	(4)	(5)
1970	d	d	\$48.947	---
1969	7565	4215	66.236	\$ 92.5
1968	7566	4303	69.121	95.3
1967	6480	3922	68.367	89.8
1966	8651	5736	75.747	94.0
1965	10478	6272	68.052	90.9
1964	12023	7598	76.732	99.1
1963	14119	7255	79.301	116.8
1962	12992	6290	59.455	91.1
1961	10920	5623	49.765	73.2
1960	10255	6239	54.205	71.7
1959	7345	4242	36.829	50.3
1958	8487	4445	30.779	44.8
1957	8116	3777	d	---
1956	7012	2451	d	---

^aSource: MARAD, Office of Market Development, All Agencies (Except Dept. of Defense) Summary of P.L. 664 Exports and Imports 1956-1969, (Mimeographed).

^bSource: James R. Barker and Robert Brandwein, The United States Merchant Marine in National Perspective, (Lexington, Mass.: Heath Lexington Books, 1970), p. 35. (For data 1958-1967). U. S. Department of Agriculture, Commodity Credit Corporation, Financial Analysis Division, Indirect Subsidies Title I & IV Cargoes, Unpublished data, 1971. (For data 1968-1970).

TABLE 10--CONTINUED

^cEstimate based upon following assumptions:

(1) Subsidy differential for Title I & IV P.L. 480 Cargoes is assumed to be 200 per cent based upon Table 11 and the fact that most such cargo has been carried by non-liners.

(2) Subsidy differential for P.L. 664 cargoes other than Title I and IV shipment is 50% in excess of the foreign rate. This lower rate is used because some of these cargoes move in small volume and under conference tariff rates.

(3) Cost per ton of all types of cargo are the same.

^dData not available.

TABLE 11

ESTIMATES OF U. S. FLAG RATE
DIFFERENTIALS FOR PREFERENCE AID
CARGO

<u>Source</u>	<u>Item</u>	<u>U. S. Rate as Per cent of Foreign Rate</u>
Dept. of Agriculture ^a	1961-1966 Average for heavy grain shipments from U. S. Gulf Coast to East and West coasts of India.	241
Lawrence ^b	Data for calendar year 1962 Agriculture P.L. 83-480 Title I and IV shipments	216
Harbridge ^c House	Data for calendar year 1964 Agriculture P.L. 83-480 Title I and IV shipments	180 (Liner) 200 (Non-liner)

^aCalculated from Dept. of Agriculture data as presented in U. S., Congress, Senate, Committee on Commerce, Merchant Marine Act of 1970, Hearings, before the Subcommittee on Merchant Marine, Senate, on S3287, 91st Cong., 1st sess., 1970, pp. 696-97.

^bCalculated from data presented in Lawrence, U. S. Shipping Policies, p. 364.

^cHarbridge House, The Balance of Payments and the U. S. Merchant Marine, p. 54.

1. The unsubsidized foreign trade U. S. flag liner fleet, which in 1967 received 78 per cent of its tonnage carryings from government and military cargoes,¹ consisted of Feb. 28, 1971 of 198 ships only 34 of which were less than 25 years old and only 5 of which had been originally constructed without CDS.² In other words this fleet depended almost entirely upon vessels formerly built for the subsidized operators.

2. The foreign trade U. S. flag tramp/bulk fleet which in 1967 received 70 per cent of its tonnage carryings from government and military cargoes,³ consisted on Sept. 30, 1970 of 105 ships, one of which was less than 25 years old.⁴

Another effect of the preference cargo statutes is that they do not restrict the U. S. portion to unsubsidized

¹Barker, U. S. Merchant Marine in National Perspective, p. 49.

²Lane C. Kendall, "The Merchant Marine Rationalize or Nationalize," United States Naval Institute Proceedings, XCVII, No. 12/826 (1971), 42.

³Barker, U. S. Merchant Marine in National Perspective, p. 49.

⁴Lane C. Kendall, "Capable of Serving as a Naval and Military Auxiliary," United States Naval Institute Proceedings, XCVII, No. 819 (1971), 214.

operators. This places them in competition with subsidized operators for the same cargo at preferential rates. The subsidized operators in effect receive a double subsidy for the same cargo; preferential rates plus ODS. In the past MARAD has stated that some subsidized liners find preference cargo necessary on some trade routes to produce the volume of traffic required to operate at a profit.¹ The amount of revenue obtained from preference cargoes by the subsidized liners is a disputed figure. Barker estimates that only 4.1 per cent of the \$610 million indirect Title I and IV cargo subsidy from 1958-1967 (Col (4) of Table 10) was received by subsidized operators.² Yet, in testimony before the Joint Economic Committee, Rapping has estimated the subsidy for 1964 alone at \$75 million.³ Whatever the true value of the double subsidy it provides an advantage to the subsidized

¹MARAD, Review of Direct and Indirect Types of Maritime Subsidies (1956), p. 34.

²Barker, U. S. Merchant Marine in National Perspective, p. 34.

³Joint Economic Committee, Economic Analysis and the Efficiency of Government, Hearings, p. 477.

operators which is not tied to any ship replacement obligations.¹

Under the Merchant Marine Act of 1970 CDS and ODS assistance is extended to bulk carriers in foreign trade. It is expected that the new bulk carriers will carry a major share of government sponsored cargoes and should eventually lead to the elimination of premium rates.

Ship Exchange Program

Under a ship exchange statute, first incorporated into section 510 of the Merchant Marine Act in 1960, 125 ships have been traded-in to the Government in exchange for 121 more modern or efficient vessels owned by the U. S. reserve fleet.² The law requires that (1) "fair and reasonable" values shall be determined for the traded-in and traded-out vessels as of the date of the exchange; (2) the value of both vessels shall be calculated in the same manner and the value of the traded-out vessel shall be calculated in the same manner as its value was determined

¹An analysis of preference cargoes for 1964, which estimated the rate subsidy to subsidized operators at \$4.1 million for Title I and IV cargoes, basically agrees with Barker. It also estimates the total preference rate differential including military cargoes for all carriers at \$122 million. E. G. Frankel, Study of the Method, Effectiveness, and Potential of Government Subsidy to the U. S. Merchant Marine, prepared for Office of Naval Research (Cambridge, Mass.: Massachusetts Institute of Technology, 1968), pp. 36-44.

²MARAD, Annual Report FY 1970, p. 14.

when it was traded-in; and (3) vessels traded-in before Oct. 1, 1960 shall be valued on a basis which yields the "highest fair return" to the Government commensurate with the intended purpose of the statute which is to improve the non-subsidized U. S. flag merchant marine in domestic and foreign service. It is an additional requirement that all repairs and conversions of traded-out vessels be accomplished in U. S. shipyards.¹

There can be three subsidy effects of this program. The first is the benefit to operators resulting from the Government's willingness to trade-out vessels in return for obsolete vessels even if there is no monetary gain to the operator in the exchange. The second is the monetary gain to the operator if the Government does not require a monetary payment to balance the excess value of the vessel traded-out in the exchange. If this occurs it is a direct subsidy cost to the Government. Finally the ship exchange program does provide employment to U. S. Shipyards.

This author has been unable to resolve the magnitude of a direct subsidy in the ship exchange program. Lawrence states that the Government does resell traded-in vessels,

¹Merchant Marine Act, 1936, Sec. 510 (i).

"usually at a small loss".¹ Recently Barker estimated the subsidy costs of the exchange program at \$301 million for the period 1960-1967.² MARAD does not recognize any subsidy effect of this program. On the contrary they publicize the \$24.4 million cash received in excess value of the ships traded-out over those traded-in. This excess value has averaged \$200,000 per vessel traded-out for the life of the program through 1970. In the more recent period of 1966-1970 the average has been \$285,000 per vessel.³ These figures would appear to be minimal compensation considering the probably poor condition of some of the trade-ins. (The largest categories of trade-in vessels have been 31 old Liberty ships and 22 ferries.)⁴

Many of the ships traded-out are intended for conversion to other types. For example in FY 1969 15 of the 17 ships traded-out were planned for conversion, 12 of them

¹ Lawrence, U. S. Shipping Policy, p. 225.

² Barker, U. S. Merchant Marine in National Perspective, p. 34.

³ MARAD, Annual Report FY 1970, pp. 13-14.

⁴ Detailed evidence of this is provided in an analysis of the Exchange Program for the years 1961-1966 in Frankel, Study of the Method, Effectiveness, and Potential of Government Subsidy to the U. S. Merchant Marine, pp. 21-35. Among other factors Frankel notes that 72.5 per cent of the vessels traded in during that period were subsequently scrapped or classified as scrap.

to containerships. It is apparent from the FY 1969 data, which identifies trade-ins, trade-outs, conversion intended, and cash received, that the ships to be converted were traded-out at bargain rates in the interest of encouraging operators to undertake the expense of the conversions.¹

From a review of the limited information available it appears that;

1. there is a subsidy effect in the ship exchange program.

2. Barker has over estimated the value of the subsidy probably by costing the traded-out ships at their construction cost or a market value which is unrealistic considering the fact that there is no market for vessels such as the 50 C-4 troop ships traded-out, other than as a conversion possibility.²

For lack of better data Barker's subsidy figures are presented in column (3) of Table 12. There are in addition administrative costs to the program which are included in the operating aids budget figure discussed under ODS.³ Of

¹ MARAD, Annual Report FY 1969, p. 31.

² The C-4's which represent better than 40% of the vessels to be traded-out are all to be converted (26 to containerships, 18 to breakbulk cargo, and 6 miscellaneous). MARAD, Annual Report FY 1970, p. 13.

³ FY 72 Budget Appendix, p. 275.

TABLE 12

SHIP EXCHANGE PROGRAM
(\$ in Millions)

FISCAL YEAR (1)	NUMBER TRADED-OUT (2)	SUBSIDY COST (3)	COST TO SHIPYARDS (4)
1970	1	n.a.	n.a.
1969	17	n.a.	n.a.
1968	22	32.0	89.2
1967	15	54.0	58.0
1966	13	41.0	42.3
1965	18	45.0	109.9
1964	16	50.0	39.2
1963	11	39.0	3.9
1962	4	22.0	8.2
1961	4	18.0	8.3
TOTAL	121	301.0	353.8

Source: (a) Columns (2) and (4) from MARAD, Annual Report FY 1970, p. 14. Column (4) is estimated cost of putting traded-out ships to sea or to U. S. shipyards. 1968 figure is partial data for 16 ships.

(b) Column (3) is from Barker, U. S. Merchant Marine in National Perspective, p. 36. Calendar year data has been converted to fiscal year by averaging two years. 1968 data is through Dec. 31, 1967 only.

more interest in Table 12 is the employment gained by U. S. shipyards. The only data available is an annual MARAD estimate of the total cost of putting the traded-out ships to sea or to the shipyards for repair and conversion. Since most have been converted, the conversion costs are the largest factor in the MARAD figures. Some of this conversion work has gone to the major private shipyards, although much has gone to yards specializing in conversion and repair.

War Risk Insurance

Under Title XII of the Merchant Marine Act, 1936 war risk insurance is available to any U. S. registered vessel. It is also available to U. S. flag vessels transferred to PANHONLIB (Panama, Honduras, Liberia) flags or built by U. S. citizens in foreign countries and registered under these flags, provided the owners agree to make the ship available to the U. S. upon request in times of national emergency or war.¹ These ships are part of the Effective United States Control Fleet (EUSC) previously discussed in Chapter I. War risk insurance is financed by a revolving fund and there are no budget obligations incurred except in the event of extraordinary losses.

¹MARAD, Effective U. S. Control of Merchant Ships, pp. 6-8.

Cabotage

Title 46 U. S. Code 11 passed in 1817 restricts the domestic trades to U. S. flag vessels constructed in the U. S. The Merchant Marine Act, 1920 extended this restriction to the non-contiguous trades with Alaska, Hawaii and other possessions. Because of these protections of our domestic trade fleet it does not receive direct subsidy support. Under the 1936 Act they have been eligible for the Ship Exchange Program, Federal Ship Mortgage Insurance, and war risk insurance, and now under the 1970 Act are eligible for tax-deferred construction reserve funds.

Summary

It is apparent from this chapter that the maritime industry is the object of many and varied government subsidy-effect programs. Their total cost in 1969, the latest year with complete data, is at least \$429 million; all but \$7 million (subsidy program administrative expenses) of which represents a direct benefit to the maritime industry. Even this figure is considered low because it does not include preference rates paid for military and military aid cargoes, assumes a low preference rate for non-military cargoes (refer to Tables 10 and 11) and assumes no subsidy for the Ship Exchange Program (Table 12).

Government policy to maintain cost parity between U. S. and foreign ship operators is given effect primarily through the direct operating-differential and construction-differential subsidies. The cost parity concept is clouded, however, by a plethora of indirect subsidies including mortgage guarantees, cargo preference, tax benefits, cabotage laws, and trade-in/trade-out programs, to the point that the absolute costs and effects are almost impossible to measure.

Cargo preference aid, second only to operating-differential subsidy in its annual cost, under-writes the existence of antiquated U. S. flag unsubsidized liner and non-liner fleets, while providing no incentives or requirements for ship replacement. With its administration divided between several agencies and the subsidy aspects of its funding not identified in the Federal Budget, its costs and effects have been shielded from the visibility that explicit agency responsibility, and the executive and congressional budget review processes were designed to provide.

IV. EVALUATION OF SUBSIDIES AS A STIMULUS TO SHIP REPLACEMENT

The U. S. Merchant Marine is composed of several diverse fleets operating in different economic environments. Since the purpose here is to understand the effect of government subsidy policy as a stimulus to ship construction in U. S. shipyards it is desirable to select a grouping which most clearly differentiates the economic effect of subsidies on ship replacement. Such a grouping is;

1. Foreign trade dry cargo fleet composed of subsidized and unsubsidized liners, and non-liners (tramps and bulk carriers).
2. Domestic and foreign trade tanker fleet.
3. Domestic trade dry cargo fleet.

Foreign Trade Dry Cargo Fleet

The composition of the active foreign trade dry cargo fleet is presented in Table 13 for the period 1958 to 1970. While the number of ships in the fleet was fairly steady in the period 1958 to 1969 the actual carrying capacity of the

TABLE 13

SIZE OF U. S. FLAG DRY CARGO
FLEET IN FOREIGN TRADE

YEAR	SUBSIDIZED LINER	UNSUBSIDIZED LINER	TRAMP/ BULK CARRIER	TOTAL
1970	247	146	105	498
1969	293	150	158	601
1968	303	150	164	617
1967	315	145	156	616
1966	322	143	135	600
1965	318	119	136	573
1964	317	131	137	585
1963	317	135	138	590
1962	298	133	144	575
1961	277	148	138	563
1960	278	144	144	566
1959	293	142	159	594
1958	305	139	147	591

Source: (1) 1958-1968 data from Barker, U. S. Merchant Marine in National Perspective, p. 39.

(2) 1969-1970 data from MARAD, Annual Reports FY 1969 and FY 1970.

fleet increased by about 50 per cent as larger more productive ships replaced those constructed during WW II. The reduction in military cargoes for Vietnam is the major cause for the fleet reduction in 1970.

The economic health of the U. S. shipping industry depends directly upon the extent to which it participates in U. S. foreign trade. While U. S. commercial and government sponsored (excluding Department of Defense) foreign trade cargoes available to liner and non-liner fleets has increased 70 per cent in the period 1958-1969, the U. S. flag portion has decreased from 15.4 to 5.7 per cent and actual carryings have decreased from 22.8 to 14.4 million tons. The decline is greatest for the non-liner U. S. flag vessels which lost 50 per cent of the tonnage they carried in 1958.¹ Indeed the tramp segment of the non-liner fleet now depends almost exclusively on military cargo under the preference statutes. On September 30, 1970, 43 of the 64 tramp ships were chartered to the Military Sealift Command.²

Because of the moderate growth of the carrying capacity of the U. S. flag fleet during the period the reduced carryings resulted in declining load factors and therefore a lower

¹MARAD, Annual Report FY 1970, p. 27.

²Kendall, "Capable of Serving as a Naval Auxiliary," 214.

return on investment. James Barker states that the average vessel utilization rate declined from over 85 per cent in 1958 to about 65 per cent in 1967.¹ The return on investment figures for the subsidized operators during the period since the start of the ship replacement program are shown in Table 14. Subsequent to the first 3 years of the program the returns on investment have ranged from 6.47 to 3.11 per cent and have been at their lowest level for the last three years. Also shown in Table 14 is the long term debt-equity ratio for the five year period 1965-1969. The steady trend of increasing long term debt is the result of increased borrowing necessary to finance new ships as the tax deferred reserve funds have been depleted. As of June 30, 1970 only two of the thirteen subsidized operators had sufficient reserve funds remaining to pay the owner's cost for at least one ship at present prices.² In any event it is clear that unless the subsidized operators can improve their financial condition by a major increase in the amount of cargoes carried and significant cost reductions they will be unable to continue or increase the fleet replacement without increased government support.

¹ Barker, U. S. Merchant Marine in National Perspective, p. 52.

² MARAD, Annual Report FY 1970, p. 77.

TABLE 14

SUBSIDIZED LINES
 PROFITABILITY AND LONG-TERM FINANCIAL STRENGTH
 (\$ in thousands)

YEAR	STOCK- HOLDER'S INVESTMENT	EARNINGS AFTER TAX	RETURN ON INVESTMENT	TOTAL EQUITY	LONG TERM DEBT	DEBT- EQUITY RATIO
1969	\$927,296	\$29,514	3.18%	\$1,797,074	510,443	28.4%
1968	896,503	27,875	3.11	1,679,808	439,458	26.1
1967	966,904	33,979	3.51	1,702,247	419,378	24.7
1966	955,820	61,847	6.47	1,592,020	334,300	21.0
1965	907,677	39,157	4.31	1,451,192	277,860	19.1
1964	880,296	53,527	6.08	NA	NA	
1963	835,650	44,750	5.36	NA	318,744	
1962	804,466	37,905	4.71	NA	270,259	
1961	774,472	28,481	3.68	NA	243,089	
1960	747,492	27,235	3.64	NA	235,792	
1959	728,784	29,835	4.09	NA	198,478	
1958	709,094	52,000	7.33	NA	177,602	
1957	655,019	70,609	10.78	NA	179,543	
1956	588,244	73,599	12.51	NA	171,716	

Source: Based upon Combined Financial Statements for all subsidized operators filed annually with the Maritime Administration. Missing data not available.

In effect the subsidy program has failed to provide a merchant marine which in fact carries a substantial portion of our foreign trade. The reasons for this are believed by the author to be inherent in the nature and administration of the program. Until the 1970 Act there was no action to increase the U. S. flag share of foreign trade carryings except to insure protection of government sponsored preference cargoes. But more germane to this thesis are the failings of the subsidy programs to come to grips with the economic realities of the U. S. flag environment.

Subsidized Fleet Replacement Program

Almost from the start of the program it was evident that major changes were needed for the U. S. flag fleet to be commercially viable. At that time the major portion of the subsidized fleet consisted of World War II built C2 breakbulk cargo ships. An analysis of representative 1958 cost data for these 15 knot, 8000 ton cargo capacity ships showed that improvements in the ship itself would have little effect on overall transportation costs and that radically changed cargo handling and other means of reducing labor costs were essential to attaining significant cost reductions. This analysis showed;¹

¹ Douglas C. MacMillan and T. B. Westfall, "Competitive General Cargo Ships," Society of Naval Architects and Marine Engineers Transactions, LXVIII (1960), 837.

1. Labor costs (both shipboard and cargo handling) were the dominant factor in transportation costs representing 54-60 per cent of costs before subsidy (48-57 per cent after subsidy).

2. 88 per cent of subsidy went to cover shipboard labor costs.

3. 60-75 per cent of the cost of transporting cargo by ship was expended in port, with cargo handling amounting to 37-53 per cent of costs to the operator after subsidy.

The data indicated not only a need but a dichotomy of interest differentiating government and operator outlooks towards the ultimate replacement of these ships. The Government which was spending 88 per cent of its subsidy dollar towards crew costs tended to emphasize crew reduction through development of shipboard automation. This viewpoint was further emphasized by the national defense emphasis on higher ship speeds which as will be seen further increased crew sizes. To the operator however, looking at out of pocket costs after subsidy, the costs related to in port time and cargo handling were of primary importance. Also in considering ship replacement the operator was faced with a marked increase in capital expenses. Whereas the WW II C2's had been purchased under the 1946 Ship Sales Act for about

\$1 million, a new ship of similar capability would cost the operator four times as much even with subsidy. The increased annual depreciation and insurance expense (10-15 per cent compared to the 3-5 per cent for a war built ship) for such an outlay was estimated to be more than the then current average net income of the typical C2.¹ Overall the operator needed a transportation system with greater productivity in order to earn a reasonable profit.

The resultant replacement program was to develop a modern high speed breakbulk cargo liner fleet. By 1964 the subsidized fleet had four times as many 20 knot cargo liners as the rest of the world combined and of the 47 such vessels under construction worldwide, 35 were for the subsidized operators.² The cost of these vessels to the subsidized operator have averaged from \$5 to \$9 million. In general the cost increase of replacement vessels over prewar costs have exceeded the increase in the general U. S. shipbuilding index. The major cost factors in this difference are attributable to subsidized ship contracting procedures and design requirements.

¹Ibid., 838.

²CASL, U. S. Liner Fleet, p. 2.

The contract plans and detail specifications for replacement vessels are developed by naval architect firms to suit the owners desires and requirements. They are used to obtain bids and closely control construction after contract award. The plans and specifications are not tailored to the construction methods in any one yard and the shipbuilder is narrowly restricted in construction practice. One analysis of this area showed a marked dissimilarity between two type ships of the specifications of components, materials and systems designed to perform the same function. A necessary result of this practice has been the proliferation of individualized ship designs, component specifications, and the limiting of contract awards to generally 3 to 4 ships. In contrast to this procedure, designs and specifications for unsubsidized ships are generally developed in direct negotiations between the owner and the shipbuilder. The developed specifications are less complicated and incorporate the techniques and experience of the shipyard.

Another cost factor related to plans and specifications is the duplication of inspection and regulatory agencies involved in their review and approval. These are American Bureau of Shipping, Coast Guard, MARAD, and the Public Health Service. There is much duplication between the efforts of

these agencies and it extends over into the inspection of construction as well.¹

The second major cost factor are the design requirements basically established by MARAD. The major elements in this area are;^{2,3}

1. Ship speed - MARAD has required subsidized ships to have a speed of 18 knots for shorter runs and 20 knots for longer runs. The usual solution to this requirement has been to increase ship size as well as power (finer hull form and additional length being required for more efficient powering). The result is to increase price by 15 per cent over a two knot slower ship. MARAD has considered the cost of this approach justified as high speed ships appear to attract cargo and offer a greater assurance of a competitive economic life. Conversely operators have contended that in some trades the minimum speed requirements ignore operating conditions of specific trade routes such as optimum sailing schedules, route distances, and port delays which negate the

¹L. C. Hoffman and C. C. Tangerini, "Reducing Costs of American Ships," Society of Naval Architects and Marine Engineers Transactions, LXIX (1961), 523-525 and 530-531.

²Ibid., 523-530.

³W. J. Dorman and J. J. Henry, "U. S. Cargo Ship Cost Considerations," Society of Naval Architect and Marine Engineers Transactions, LXIX (1961), 602-607.

speed advantage. Also increased size and power not only effect first costs but result in greater crew sizes, and increased maintenance costs. Professor Harry Benford an authority on the economic problems of merchant ship design and operation observed;

In most trades the high speed ships are basically inefficient and, as competition forces other countries to follow our lead, we shall all be required to either raise freight rates or go broke.¹

2. Power margin - A related factor is MARAD'S requirement for a 25 per cent additional shaft horsepower margin over that required for design at full load. (Until 1961 there was an additional 10 per cent power margin for establishing the certified rating of the plant.) The margin used in many foreign ships is 15 per cent and that figure has also been recommended by the Society of Naval Architects and Marine Engineers.

3. Cargo handling - Other than to require a minimum boom lift capacity (which some operators objected to as too high) little was done by MARAD to encourage designs which would reduce the significant cargo handling costs. There were numerous industry criticisms of this fact but probably the most telling is the following admission by the MARAD

¹ Harry Benford, Discussion on Hoffman, "Reducing Costs of American Ships," 541.

Chief Office of Construction and the Assistant Chief,
Division of Ship Design:

It is admitted the concept of most of our present cargo-handling arrangements is too deeply bound by tradition and technical progress has been disappointing.¹

4. Miscellaneous - Other factors reported as increasing first or operating costs of subsidized construction over unsubsidized or foreign ships include, MARAD subdivision and damage stability requirements, national defense features, and MARAD shock resistance design criteria.

5. Crew size - Prominent factors in operator/union crew size negotiations are gross tonnage and horsepower. Since the trend for new construction was an increase in both areas crew sizes also increased. Whereas C2 cargo ships had crews of 47 some new designs had crews of 55. Since the Government bore the major share of these costs MARAD research and development was directed towards automation and the reduction of maintenance.

The resulting breakbulk liner fleet while enhancing the military auxiliary role of the merchant marine was not sufficiently productive to be profitable. Cargo handling costs continued to rise at about 6 per cent per year between

¹Hoffmann, "Reducing Costs of American Ships," 529.

1960 and 1966.¹ The speed advantage which for a 20 knot ship in the North Atlantic Trade made only a 32 hour difference in total transit time, including port time, over a 16½ knot ship was generally not realized. Port loading and unloading delays increased and overall delivery times were little better for the high speed ships.² In 1967 MARAD voyage data for the 14 subsidized lines indicated approximately 47 per cent of voyage days were spent in port.³ The increasing ODS necessary to support this fleet acted, as a brake on the increasing appropriations necessary to continue the replacement program. As shown in Table 4 after a steady increase from 1954 to 1962, CDS expenditures dropped significantly to an annual rate of less than 50 per cent of ODS.

Returning to the analysis which started this section, MacMillan and Westfall prepared an economic comparison of alternative fleets of 10,000 ton cargo capacity ships (basically C4 types) designed to provide weekly service on an assumed 8,000 mile round voyage trade route as a means to

¹Barker, U. S. Merchant Marine in National Perspective, p. 23.

²Edward V. Lewis, "Research Toward More Efficient Transportation By Sea," Society of Naval Architects and Marine Engineers Transactions, LXIX (1961), 135-137.

³Barker, U. S. Merchant Marine in National Perspective, p. 26.

illustrate the productivity possibilities of differing replacement vessel designs. Partial results are summarized in Table 15. While absolute cost and profitability figures are open to question it is the relative magnitudes between choices which are significant.

1. The discussion heretofore has discussed the differing government and operator view points concerning speed for conventional ships. Columns (1), (2), and (3) show that a fleet of 20 knot conventional ships results in a 38 to 48 per cent reduction in the owner's return on investment after subsidy (depending on whether semi-automated or not) when compared with a 15 knot fleet. Of course if the higher speed ships attract more cargo the 15 knot fleet advantage would not be as great. As we have seen, however, the full speed potential of 20 knot ships has not been realized. The Government however can reduce its operating subsidy by 22 per cent and still get the higher speed it desires by requiring a 20 knot semi-automated fleet. Notice the Government receives no overall subsidy cost savings per ton carried because of the higher CDS costs, but it does meet the stated objective of a modern fleet capable of serving as a naval auxiliary.

TABLE 15

COMPARISON OF FLEET ECONOMICS
8000 MILE ROUTE - 675000 L. TONS CARGO/YEAR^a

Each Ship 10000 L. Ton Cargo Capacity

Column No.	1	2	3	4	5	6
Ship Speed	15	20	20	20	20	20
Ship Type	Conventional	Conventional	Conventional	Container	Container	Container
No. in Fleet	6	5	5	3	3	3
Semi-Automated ^b	No	No	Yes	No	Yes	Yes
Subsidized	Yes	Yes	Yes	Yes	Yes	No
Cost to Owner						
Annual Costs (%)						
Port	6	6	6	10	11	11
Overhead	7	7	7	11	14	11
Fuel	3.5	5	5	9	11	9
Maintenance	3	3	3	3	4	4
Crew	4	4	2	4	3	7
Cargo handling	64.5	62	63	38	27	21
Amortization	9	11	11	22	27	33
Insurance & Other	3	2	3	3	3	5
Cost \$/L. Ton	31.4	32.8	32.3	19.4	16.1	20.1
Total Investment-\$1000	27,000	32,750	33,375	30,200	30,580	52,550
Return Investment-%	8.9	4.6	5.5	34.9	41.7	19.0
Cost to Gov't.						
CDS (50%)-\$1000	27,000	32,750	33,375	21,600	21,975	0

TABLE 15--Continued

ODS/Yr. - \$1000	2,406	2,760	1,885	1,698	1,170	0
Annual Capital Cost-\$1000	1,916	2,324	2,368	1,533	1,559	0
Annual Cost-\$1000	4,322	5,184	4,253	3,231	2,729	0
Cost \$/L. Ton	6.4	7.7	6.3	4.8	4.0	0

Source: MacMillan, "Competitive General Cargo Ships," 853-855.

^aAssumed annual revenue for each fleet is the same, \$23,610,000.

^bSemi-automated ships have crew of 26. Non-automated crew sizes are 47 and 55 for 15 and 20 knot ships respectively.

2. A more significant comparison however is that under similar basic conditions the transportation cost for subsidized containerships are substantially lower (Columns (4) and (5)) than for conventional ships. Because container transport is capital intensive there are economies of scale not realizable by the breakbulk operator. Cargo handling as a per cent of annual fleet costs is cut in half. Since there are fewer vessels in the fleet there are savings to the Government in both operating and construction subsidies.

3. Of greatest importance to the commercial viability of the U. S. flag merchant marine is the possibility for profitable unsubsidized container fleet operation summarized in column (6). Predicted profitability is four times that for a subsidized breakbulk fleet.

In spite of this study, and others, the containerization break through came not from MARAD and the subsidized operators, but from " . . . two independent sources, one a trucker turned shipper and the other a nonsubsidized steamship company."¹ (It was not until 1968 that the subsidized replacement program included a new construction containership.) Also the predictions of significant productivity increases and

¹James J. Henry and Henry J. Karsch, "Containerships," Society of Naval Architects and Marine Engineers Transactions, LXXIV (1966), 307.

unsubsidized operation for containerization have come true, as well as those for only marginal improvements with high speed liners. Examples of this are;

1. From 1965 data for subsidized costs of cargo vessels by type of vessel it is possible to calculate an average ODS per voyage day for each type.¹ The carrying capacity of each type vessel can be characterized by its annual lift capacity. Barker has done this for each type in terms of a standardized unit - the General Purpose Ship (GPS).² Utilizing the data from these two sources the voyage day ODS per GPS can be calculated as a measure of relative productivity of each ship in terms of ODS expenditures.

<u>Vessel</u>	<u>ODS/voyage day</u>	<u>GPS equivalent</u>	<u>ODS/GPS</u>
C2	\$1380	0.559	\$2470
C4 (New)	\$1930	0.841	\$2295

The C4 vessel is only 7 per cent more efficient in these terms than is the C2 vessel.

2. In 1967 the return on investment for the two U. S. flag unsubsidized container operators were 9.6 and 20.5 per cent - a higher rate of return than for any other U. S.

¹Ernst, Economic and Financial Data, pp. 53-54.

²Barker, U. S. Merchant Marine in National Perspective, pp. 117-120.

operator. The latter figure was for Sea Land, the only all-container operator.¹

3. A 1968 study showed a loss of significance of operating and construction-differential subsidies similar to that in columns (4), (5) and (6) of Table 15 because a containership can generate about five times as much annual revenue as a C4 breakbulk ship for the same annual ODS expenditure. In a break-even analysis for a 25 knot, 1200 container capacity ship the study predicted the following breakeven rates in cents per cubic foot capacity for various percentages of cubic utilization:²

Trip Voyage	Breakeven Rate (cents/cu.ft.)	
<u>Utilization (%)</u>	<u>Subsidized</u>	<u>Unsubsidized</u>
25	50	63
50	30	37
75	23	28
100	20	23

Since the prevailing average North Atlantic freight rate was then 78 cents per cu. ft. (equivalent to \$32 per long ton)

¹Kenneth A. Meyers, "How Important Will Subsidy Be in the Future," Society of Naval Architects and Marine Engineers Transactions, LXXVI (1968), p. 367.

²Ibid., 353.

an unsubsidized containership could operate profitably at the 65 per cent average utilization rate for U. S. liners. The conventional ships of columns (1) to (3) of Table 15 could not make any profit at the \$32 per long ton rate. These predictions are further borne out by the fact that in 1970 both United States Lines and American Export Isbrandtsen took 16 containerships off subsidy, mostly in the North Atlantic trade.¹

Non-Liners

As stated previously this fleet is antiquated and heavily dependent upon government preference cargoes with their higher rates. Aside from several owned or under long term charter to industrial firms for the import of ores and other industrial raw materials, most of the fleet is engaged in single voyage or short term contract carriage. While non-liner cargoes in U. S. foreign trade have increased from 116 to 207 million long tons in the period 1956 to 1969, the U. S. flag share has decreased from 16 to 4 million long tons. In 1969 the U. S. flag's share was only 2.1 per cent of the non-liner's total. Currently better than 90 per cent of this tonnage is in bulk cargoes and the U. S. failure to

¹MARAD, Annual Report FY 1970, p. 5.

carry a greater share is a direct result of its lack of a modern bulk cargo fleet.¹

Foreign fleets consist of 14-16 knot bulk carriers averaging 25-60,000 DWT. Our non-liner fleet consists primarily of WW II vessels, some converted, of less than 15000 DWT and only one of which was built as a bulk carrier. A measure of the inefficiency of the U. S. flag fleet is a comparison of the unit cost of transportation for the U. S. vessels and modern foreign bulk carriers, Table 16. Of interest is the proposed 16 knot, 36-38,000 DWT U. S. bulk carrier. It can operate for $\frac{1}{2}$ the cost of our most efficient bulk conversion, when built with 50 per cent construction subsidy. A 1965 study for MARAD showed that 30 of these ships could replace about 106 marginal ships and the resultant bulk fleet would have no vessels less efficient than the 23,500 DWT converted T2. Also it would be profitable to operate the new ships at 25 per cent below the preference cargo rates-that is at an intermediate rate which is approximately the arithmetic mean of the U. S. and foreign rates.²

¹MARAD, Annual Report FY 1970, pp. 4 and 27.

²Mack-Forlist, "Economic Feasibility of U. S. Bulk Carriers," 146-148.

TABLE 16

COMPARATIVE UNIT COST
OF BULK TRANSPORT

SHIP TYPE	DWT	U. S. CENTS PER 1000 TON MILES ^a
LIBERTY	10,750	110
C2	10,500	97
AP2	10,750	88
C3	12,500	86
C4	14,750	79
Converted T2	16,000	82
Converted T2	23,500	62
Proposed U. S. Bulk	36-38,000	31 ^b
Foreign Bulk	23,000	24
Foreign Bulk	33,000	19
Foreign Bulk	42,000	16

Source: D. M. Mack-Forlist and R. Hettena, "An Economic Feasibility Study of United States Bulk Carriers," Marine Technology, III, No. 2 (1966), 145-146.

^aCost data are as of September, 1965 and include both operating and capital costs.

^bAssumes 50 per cent construction subsidy.

The possibility of a modern bulk fleet provided an alternative to the average \$92 million per year (Table 10) expended in preference rates, mostly for bulk cargoes. The new fleet could be financed from the 25 per cent rate reduction (\$23 million). The cost of each new ship would range between \$8.08 million and \$10.7 million depending upon whether they were built at least 10 ships to a builder under a stable program, or in one ship contracts. Assuming the ships were let in groups of 5, to 6 different builders during the course of this program, the cost per ship would be \$9.06 million of which the government subsidy would be \$4.53 million. One such contract could have been let a year for 6 years at an increase of \$22.7 million in construction subsidy. Each vessel would repay its construction subsidy cost in preference rate savings in 6 years. The ships could operate in one of three modes;¹

1. Preference cargoes at a 25 per cent lower rate.

2. Half the time at U. S. rates with preference cargoes and the remaining time in the open market against foreign competition.

3. Under an operating differential subsidy which provides equivalent support.

¹Ibid., 145 and 151.

Domestic and Foreign Trade Tanker Fleet

The U. S. flag tanker fleet has been fairly stable in size over recent years. As of June 30, 1970 it consisted of 249 active ships of 6.8 million DWT. There were 175 in domestic trade, 29 foreign, and 42 under government charter.¹ The fleet is for the most part owned and operated by financially secure oil companies in their own service.

The domestic segment of the fleet is protected by cabotage and has no foreign competition. It has been the primary source of unsubsidized ship construction in U. S. shipyards. The need for ships is based solely upon the economic factors of oil demand and the relative costs of water transport versus other transport means. This demand is expected to increase markedly with the shipment of Alaskan oil to East and West coast ports. A Commerce Department report of October, 1971 on the economic effects of the Trans-Alaska pipeline system projects a requirement for 41 tankers by 1980 of which 33 will be new construction in the 120-250,000 DWT class.² There are currently two - 225,000 DWT U. S. flag tankers under construction in a U. S. yard;³ the largest

¹MARAD, Annual Report FY 1970, p. 61.

²Shipyard Weekly No. 44 (Nov. 4, 1971).

³MARAD, Annual Report FY 1970, p. 7.

since the 108,000 DWT Manhattan was built in 1962.

The ships of the foreign trade segment are older and smaller than their foreign competition. They cannot compete with the charter rates offered by foreign super tankers. The foreign trade segment carried only 3.6 per cent of our foreign trade tanker tonnage in 1969 compared to 20.6 per cent in 1956.¹ The fleet has depended on government grain cargoes and military petroleum shipments to stay in operation.

Prospects for replacement and expansion of this fleet in the near future are brighter because of three factors. First it is now eligible for both CDS and ODS under the Merchant Marine Act 1970. It is expected that these subsidies will not only aid in replacing the present fleet, but also older ships of the EUSC Fleet in U. S. foreign trade. Second there are projections for large imports of liquified natural gas (LNG) into East Coast ports. One present subsidy application involves 6 - 90,000 DWT LNG carriers estimated to cost in excess of \$70 million each. Estimates of the eventual requirement for LNG ships to carry U. S. imports vary from 60 to 80 ships of 130-170,000 DWT

¹Ibid., p. 27.

costing \$75-90 million each if built in U. S. yards.¹ It is questionable as to how many of these ships would be built in U. S. yards as the expensive vessels might require a disproportionate share of future subsidy funds. There is a counterbalance, however, in that the U. S./foreign cost differential to build LNG carriers with their cryogenic storage systems is expected to be less than for other type vessels. Third, with increasing U. S. dependence upon oil imports there is concern that unless a significant share is carried in U. S. ships the flow could be severed. A bill (H.R. 12324) has been introduced by Chairman Garmatz of the House Merchant Marine and Fisheries Committee to require that 50 per cent of all oil imports be carried in U. S. flag ships because " . . . national security demands it."² Introduced in December, 1971 this bill was in hearings in February, 1972. The fact that this legislation is being considered so soon after passage of the 1970 Act is further evidence that the Government has yet to set clear national defense objectives for its merchant marine policy.

¹ Shipyard Weekly No. 42 (Oct. 21, 1971).

² Shipyard Weekly No. 51 (Dec. 23, 1971).

Domestic Dry Cargo Fleet

This fleet, protected by cabotage, has also been fairly stable at 70 vessels.¹ The major subsidy benefits have been the Ship Exchange Program, which has provided a source for conversion to containerships, and FSMI. Its size is dependent upon cargo demand in competition with other transport. The noncontiguous trade fleet represents 2/3 of the domestic fleet and contains the few ships built since World War II. Replacement of the domestic dry cargo fleet should remain a minor factor in U. S. flag construction. Its present ships will probably be replaced slowly with new construction containerships and breakbulk/partial container types obtained from the subsidized fleet.

Summary

The largest segment of the merchant marine is the foreign trade dry cargo fleet, and it is this fleet which has been most effected by government subsidies. The fleet is composed of subsidized and unsubsidized liners, and non-liners.

The subsidized liner fleet has been the sole recipient of government operating and construction-differential

¹MARAD, Annual Report FY 1970, p. 61.

subsidies. The 194 ship subsidized liner replacement program has been the major source of merchant construction in U. S. shipyards, and has created the only modern ships in the U. S. flag foreign trade merchant marine. The program however has been far from an unqualified success. In its early designs the program failed to recognize the need to significantly reduce cargo handling costs. The modern subsidized breakbulk liner fleet which it developed required increasingly greater operating differential subsidy to support it. Initially the increases served to limit funds available for construction subsidy until a balance was achieved where over 2/3 of the Government funds went to the operating subsidy. Not only did this policy limit the amount of subsidized construction and the size of the fleet which could be supported, but it failed to foster the early development of containerization technology and associated ship designs needed to create a profitable unsubsidized fleet.

The foreign trade non-liner fleet is antiquated and heavily dependent upon government preference cargoes for employment. While bulk cargoes amount to better than 90 per cent of total non-liner foreign trade tonnage, and statutory authority has been available since 1952 to subsidize construction of modern, efficient bulk carriers none have been built.

Funds which could have been used to build these ships have been expended through cargo preference rates to maintain a non-liner fleet which is commercially noncompetitive and of marginal national defense value.

V. THE MAJOR PRIVATE SHIPBUILDING INDUSTRY

Identification of the Industry

The major private shipbuilding industry presently consists of 13 companies operating 17 shipyards capable of constructing merchant vessels 475 feet in length by 68 feet in beam and larger. Nine of these companies plus the defunct New York Shipbuilding and Drydock Corporation are or have constructed ships under the subsidized replacement program in 13 different shipyards. The shipyards presently in business are identified in Table 17. Since 1960 most of the independent shipyards have become part of large multi-division corporations or conglomerates. This has resulted in a period of management instability that has included both internal management changes and the movement of top executives between shipyards. Only Alabama Drydock & Shipbuilding Company and Todd are independent, and of these only Todd has participated in subsidized construction.

All the shipyards are specialized toward the construction and reconditioning of ships and while they have some capabilities in other heavy industry applications they are

TABLE 17

MERCHANT SHIPS 5,000 GROSS TONS AND OVER DELIVERED FROM

U. S. MAJOR SHIPYARDS DURING THE PERIOD 1961 THROUGH 1970

	MARAD Program FY 1957 thru 1971			
	Ten Year Period Deliveries 1961-1970	Five Year Period Deliveries 1966-1970	Under Contract 1-1-71	No. of Ships Bid On Ships Awarded
<u>East Coast</u>	<u>Total</u>	<u>Total</u>	<u>Total</u>	<u>MARAD</u>
Beth. Steel Corp., SD Div. Sparrows Point, Md.	43	17	13	159 20
Newport News S.B. & DD Co. Newport News, Va.	17	5	0	95 14
General Dynam., Quincy Div. Quincy, Mass.	13	0	3	61 9
Sun SB & DD Co. Chester, Pa.	32	18	5	148 29
New York SB & DD Corp. ^a Camden, N. J.	1	0	0	70 2
Maryland SB & DD Co. ^b Baltimore, Md.	0	0	0	18 0
				129

TABLE 17--Continued

MARAD Program
FY 1957 thru 1971

	<u>Ten Year</u> Period Deliveries 1961-1970		<u>Five Year</u> Period Deliveries 1966-1970		<u>Under</u> Contract 1-1-71		<u>No. of</u> Ships Bid On		<u>No. of</u> Ships Awarded	
	<u>Total</u>	<u>MARAD</u>	<u>Total</u>	<u>MARAD</u>	<u>Total</u>	<u>MARAD</u>				
<u>East Coast</u>										
Bath Iron Works Bath, Maine	3	3	3	3	3	3	20	6		
Seatrain S. B. Corp. Brooklyn, N. Y.	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>		
Sub-total East Coast	109	68	43	24	26	10	e	80		
<u>Gulf Coast</u>										
Ingalls Nuclear SB Div. (Litton) Pascagoula, Miss.	26	26	14	14	4	0	140	31		
Litton Ship Systems Div. Pascagoula, Miss.	0	0	0	0	8	8 ^c	7	8		
Avondale Shipyards, Inc. New Orleans, La.	34	30	21	17	10	10	115	47		

TABLE 17--Continued

MARAD Program
FY 1957 thru 1971

	Ten Year Period Deliveries 1961-1970		Five Year Period Deliveries 1966-1970		Under Contract 1-1-71		No. of Ships Bid On		No. of Ships Awarded	
	Total	MARAD	Total	MARAD	Total	MARAD	Total	MARAD	Total	MARAD
<u>Gulf Coast</u>										
Alabama DD & SB Co. ^b Mobile, Ala.	0	0	0	0	0	0	13	0		
Beth. Steel Corp. ^b Beamont, Tex.	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>NA</u>	<u>0</u>		
Sub-total Gulf Coast	60	56	35	31	22	18	e	86		
<u>West Coast</u>										
Beth. Steel Corp. SB Div. San Francisco, Calif. ^b	4	4	0	0	0	0	62	4		
National Steel & SB Co. San Diego, Calif.	13	13	2	2	0	0	91	15		
Todd Shipyards San Pedro, Calif.	5	5	0	0	0	0	79	5		
Seattle, Wash. ^b	0	0	0	0	0	0	NA	0		
Lockheed SB & Const. Co. ^d Seattle, Washington	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>50</u>	<u>0</u>		

TABLE 17--Continued

MARAD Program
FY 1957 thru 1971

	Ten Year Period		Five Year Period		Under Contract		No. of Ships		No. of Ships	
	Deliveries 1961-1970		Deliveries 1966-1970		1-1-71		Bid On		Awarded	
<u>West Coast</u>		<u>Total</u>	<u>MARAD</u>	<u>Total</u>	<u>MARAD</u>	<u>Total</u>	<u>MARAD</u>			
Sub-total West Coast		22	22	2	2	0	0	e		24
GRAND TOTAL ALL YARD		191	146	81	57	48	28			190

Sources: Compiled from Seapower Subcommittee, Shipyards, pp. 10656-658. U. S. Department of Commerce, Maritime Administration, Relative Cost of Shipbuilding (Washington, D. C.: Government Printing Office, 1971), pp. 30-31. Frank O. Braynard, "United States Shipbuilding Report," Marine Engineering/Log, LXXVI, No. 7 (1971), 66.

Notes:

^aShipyard closed.

^bRecent activities confined to repair, conversion, and construction of smaller ships.

^cNegotiated price award for one APL ship.

^dDelivered one merchant type vessel to MSC in 1967.

^eBidding frequency data are for 1957 through 1970 only.

not always able to be competitive with specialized heavy industry firms. Beyond this the shipyards vary widely in size, financial capability, facility investment and modernization, and market participation. The largest, Newport News Shipbuilding & Drydock Company, has an asset value of over \$175 million, employs about 20,000, has invested \$69 million in new facilities in the 10 year period subsequent to 1960, has experienced a .75 per cent facility utilization over the past several years, and in 1970 had a stable workload backlog through 1973. One of the smallest, Bath Iron Works, has assets of about \$20 million and has invested about \$4 million in new facilities since 1965. In 1970 it was experiencing a 25 per cent utilization of facilities with a declining employment of 2,800 and no backlog of new construction orders.¹

All except one of the shipyards were either in existence before World War II or were created during the war. The Litton Ship Systems Yard is a \$130 million investment completed in 1971. Termed a "ship manufacturing facility" by Litton, it is designed for series production of ships through fabrication of preoutfitted modules of increasing size. The ship is

¹Seapower Subcommittee, Shipyards, pp. 10666, 10724, 10750, and 10893-894.

assembled by integration of the final modules weighing 6,000 to 8,000 tons.¹ The Seatrain yard was recently formed, but utilizes the facilities of the closed New York Naval Shipyard.

The financial condition of the shipyards and the profitability of their subsidized construction business is difficult to determine. The majority of the yards are not independent and are not identified separately in corporate financial statements sufficiently to analyze the results of their separate business operations. The one independent shipyard, Todd, which has participated in MARAD subsidized construction, has not done so since an award in 1959. For these reasons dependence must be placed upon the statements of industry spokesmen and the records of Congressional hearings. Unfortunately while the latter have elicited the financial experience of a number of shipyards on MARAD contracts they have for the most part been deleted from hearing records as privileged information.

There are other factors which differentiate the shipyards and have had an effect on their ability to compete and prosper. Some comprise the major industry in an area and others only a minor segment; some have been able to maintain

¹Ibid., statement Ellis B. Gardner, Jr. pp. 10807-808.

a relatively stable volume of work and therefore a cadre of skilled personnel while others have not; material and labor costs vary between yards and areas; and finally the shipyards participate in varying mixes of construction, reconstruction and repair for Navy, MARAD, or private interests.¹

Industry Activity

The level and type of activity engaged in by the major private shipyards can be stated as the annual dollar or tonnage value of contract awards, ships building or an order, or deliveries - or as an employment breakdown by types of activity. The latter approach is used here as it presents the clearest picture of the relative levels of effort differentiated by type (repair or construction) and by customer (Navy, MARAD subsidy, or private ship owner) during the period. Table 18 is a compilation of average employment figures for one month of each year from just prior to the start of the subsidized replacement program in 1956 to 1970, with MARAD estimates for projected private and subsidized merchant ship construction through 1978.

¹U. S. Department of Commerce, Maritime Administration, Relative Cost of Shipbuilding (Washington, D. C.: Government Printing Office, 1971), pp. 6-7.

MONTHLY AVERAGE EMPLOYMENT IN MAJOR PRIVATE SHIPYARDS

Date	1/56	7/56	7/57	4/58	4/59	4/60	4/61	4/62
Total Employees	N.A.	N.A.	N.A.	N.A.	65,608	55,165 (a)	64,272	59,878
Total Production	33,610	40,898	52,864	54,856	54,572	48,881	52,353	51,840
Nonship Work	3,353	3,794	5,296	3,955	2,554	2,570	2,789	2,779
Ship Repair	Repair and Construction							
Ship Construction	combined for 1956-1957							
MARAD (b)	2,559	2,234	6,425	8,007	4,019	8,574	10,332	13,713
Navy (b)	18,749	17,735	16,540	14,617	26,580	26,015	29,437	25,162
Private	8,949	17,135	24,603	20,978	15,763	5,333	4,277	2,885

Date	4/63	4/64	4/65	4/66	4/67	4/68	4/69	3/70
Total Employees	56,856	55,151	67,857	73,387	72,919	79,733	78,993	78,944
Total Production	49,332	46,934	57,290	58,978	60,262	65,429	64,824	62,078
Nonship Work	2,688	1,800	1,803	2,317	3,054	2,363	1,458	1,697
Ship Repair	6,722	7,280	10,595	10,797	17,775	11,783	13,615	15,915
Ship Construction	39,922	37,854	44,892	45,864	39,433	51,283	49,751	44,466
MARAD (b)	8,405	6,261	7,621	5,953	6,078	12,375	8,612	3,964
Navy (b)	28,526	27,743	31,797	34,393	28,604	32,667	30,168	31,505
Private	2,991	3,850	5,474	5,518	4,751	6,241	10,971	8,997

TABLE 18--Continued

Date	6/71(c)	7/72(c)	6/73(c)	6/74(c)	6/75(c)
Total Employees	-----	-----	-----	-----	-----
Total Production	-----	-----	-----	-----	-----
Nonship Work	-----	-----	-----	-----	-----
Ship Repair	-----	-----	-----	-----	-----
Ship Construction	-----	-----	-----	-----	-----
MARAD (b)	8,000	11,500	10,500	14,000	16,000
Navy (b)	-----	-----	-----	-----	-----
Private	6,250	9,000	7,750	8,500	6,750

Source: MARAD data presented in Seapower Subcommittee, Shipyards, pp. 10655 and 10663, for 1958-1978 and Shipbuilders Council of America, Statistical Quarterly-First Quarter 1970, for 1956-1957.

Notes:

^aLabor dispute affecting Bethlehem Steel lowered employment.

^bOther Federal Agency Projects included in either Navy or MARAD totals for 1958 through 1965 and in Navy total only after 1965.

^cMARAD estimates. Estimates remain constant from June, 1975 through June, 1978.

During the period total production employment has doubled with construction being the largest source of employment, 72-85 per cent. The initial and largest buildup in 1956-1957 was primarily due to the influx of private construction orders. In July, 1957 MARAD employment tripled with the start of the subsidized replacement program. Both in 1957 and 1958 merchant ships accounted for 66 per cent of construction employment. Then a major change occurred in 1959 with the reversal of the Navy versus merchant ship share of construction employment. For every year since 1959 Navy construction has been the dominant source of employment and the primary stabilizing influence in the industry. It has averaged 48 to 58 per cent of all production employment and 61 to 73 per cent of construction employment. Of the 13 shipyards which have participated in the subsidized construction program all but two (Sun and Seatrain) have also built naval ships.

Overall work force employment and facility utilization have been below that required for maximum efficiency. In 1970 it was estimated that present facilities were employing a work force on the range of 55-60 per cent of optimum numbers

and that facility utilization was approximately 60-65 per cent of facility capacity.¹

Ship repair employment has also doubled during the period. The work has been split between Navy and private merchant ships with direct MARAD work a negligible factor. Only in 1967 did MARAD repair work amount to more than a few hundred employees, and this was related to the reactivation of ships from the reserve fleet.² Much of the private repair work is a result of the requirement of the Merchant Marine Act, 1936 that subsidized vessels must be repaired in the U. S. and until the 1970 Act subsidized operators received a subsidy of about 32 per cent of the cost of such work.³ Also repair work accomplished overseas on U. S. flag ships is subject to customs tax upon return of ship to the U. S. Thus for subsidized ships the cost advantages of foreign repairs are less than might be expected. Repair work will not be considered further and the remainder of this chapter will concentrate on merchant ship construction since this is the primary effect of the merchant marine subsidies on the industry.

¹Seapower Subcommittee, Shipyards, p. 10690.

²Ibid., p. 10655.

³Ernst, Economic and Financial Data, p. 52.

Merchant Ship Construction

In analyzing merchant ship construction use will be made of Tables 17, 18, and 19, but first there are inconsistencies about the latter which should be understood. All data related to subsidized construction are accurate for the major private shipyards. Data for other types of employment however are not explicitly limited to the major yards and include some construction by smaller or Great Lakes yards. The effect of the other yards is small. For instance of the 203 merchant ships 1000 G.T. and over delivered by all private yards between 1961 and 1970 (Table 19), 192 were ships 5000 G.T. and over delivered by the major private shipyards (Table 17). (Most of the error is in the U. S. Flag No. Subsidy Account.) Table 19 therefore will be used as a measure of overall major private yard employment during the period.

Total annual awards, construction backlog, and deliveries have varied widely as also has merchant ship construction employment. The period started with a tripling of production workers engaged in merchant ship construction to a high of 31,000 in 1957 and subsequently decreased to a level in 1960 and later of about $\frac{1}{2}$ that amount. The cause of the peak was the 103 ships awarded in 1956 and 1957

TABLE 19

MERCHANT TYPE VESSELS AWARDED, BUILDING,
AND DELIVERED BY U. S. PRIVATE SHIPYARDS
(1000 gross tons and over)

CALENDAR YEAR	AWARDS		ON ORDER OR BUILDING		DELIVERIES				
	TOTAL	CONSTRUCTION SUBSIDY	TOTAL	CONSTRUCTION SUBSIDY (As of January 1)	TOTAL	CONSTRUCTION SUBSIDY	GOV'T ACCOUNT	U. S. FLAG NO SUBSIDY	FOR FOREIGN REGISTRY
1956	68	4	25	0	9	0	2	4	3
1957	35	0	81	4	23	0	7	13	3
1958	22	19	84	4	31	4	3	17	7
1959	19	15	73	19	32	0	1	20	11
1960	23	23	60	34	25	9	1	13	2
1961	34	22	57	48	25	18	0	7	0
1962	15	14	66	52	27	23	1	3	0
1963	25	18	54	43	34	26	0	8	0
1964	18	17	45	35	16	11	0	5	0
1965	16	9	47	41	16	11	0	5	0

TABLE 19--Continued

CALENDAR · YEAR	AWARDS		ON ORDER OR BUILDING		DELIVERIES				
	TOTAL	CONSTRUCTION SUBSIDY	TOTAL	CONSTRUCTION SUBSIDY (As of January 1)	TOTAL	CONSTRUCTION SUBSIDY	GOV'T ACCOUNT	U. S. FLAG NO SUBSIDY	FOR FOREIGN REGISTRY
1966	16	14	45	39	13	12	0	1	0
1967	29	11	48	41	13	10	1	2	0
1968	23	11	64	42	24	17	0	7	0
1969	8	0	63	36	22	14	0	8	0
1970	13	8	49	22	13	3	0	10	0
1971	N.A.	9	49	27	N.A.	N.A.	0	N.A.	0

Source: MARAD merchant ship construction data and Long Range Cargo Ship Replacement Program as summarized in Shipbuilders Council of America, 1970 Annual Report; Statistical Quarterly - Third Quarter 1970; Statistical Quarterly - Second Quarter 1969, and updated through June 30, 1971.

combined, most of which were for foreign registry or unsubsidized U. S. flag. The closing of the Suez Canal created a large tanker demand at the time and U. S. yards were able to obtain foreign orders because they offered faster deliveries than some over-booked foreign yards. Since that event U. S. shipyards have not competed for foreign construction.

Private project employment decreased to a low of 2,900 employees in 1962-1963 and subsequently increased substantially to a 9-11,000 level in 1969-1970. Over 100 of the 124 unsubsidized U. S. flag ships delivered between 1956 and 1970 were tankers. (The difference is primarily small ships built in other than the major yards.) The cyclical variation of production employment and deliveries has been related to the replacement policies of the domestic tanker fleet. The initial tanker construction was to meet increased fuel carrying demand, while the recent increase has a two-fold purpose of replacing the 70 odd-ships which are over 20 years old and to increase efficiency and capacity with larger ships.¹ Although labeled as "no subsidy" practically all ships were built with government mortgage insurance. Whether or not there was government

¹S. W. Emory, "The United States Effective Control Fleet," United States Naval Institute Proceedings, XCVI, No. 5/807 (1970), 168.

mortgage aid is believed of little importance because cabotage laws require the domestic fleet to be built in U. S. shipyards, and construction has been on the basis of cargo demand not speculation of profitable employment.

Government construction account includes ships built for the Military Sealift Command (MSC) and other government construction under TITLE VII of the 1936 Act. As discussed in Chapter III, TITLE VII has not been used for merchant ship construction since the 1951 Mariner program, the last of which were delivered in 1955. Government account construction has been a negligible factor.

The MARAD subsidized ship replacement program has had a stabilizing influence on the industry. Between 1958 and 1966, 155 of the 188 merchant ship construction awards were for subsidized ships. Were it not for these awards the industry order books for the years 1961 through 1967 would have averaged only 12.6 merchants on order or building. Yet the subsidized program has not been a very stable source of employment itself. Changes of greater than 30 per cent in employment level have occurred in 7 of the 12 inter-year intervals between 1958 and 1970, and of 50 per cent or more in 4 of the 12 years.

Changes in program levels which cause shifts between the employment categories of Table 18 without decreasing total employment are very disruptive. An example is 1967, which Table 18 indicates as the third year of a four year upswing in total employment, while suffering a one year drop in construction employment. In that year the industry layoff rate was 5.4 per cent as against 2.2 per cent for the entire transportation equipment industry (of which shipbuilding is a part) and simultaneously there were shipyard complaints of lack of skilled manpower. An industry experiencing skill shortages would be expected to have a lower than average layoff rate. Apparently the yards experiencing shortages are not those laying men off and the effects of changing private/subsidized/Navy construction and repair work mixes cause instabilities not apparent in gross industry figures.¹

Before proceeding to a more detailed analysis of the subsidized construction programs' effect on the individual major shipyards it is well to consider its average annual effect in terms of awards, order book, and deliveries. Rather than calculating an average for 1956-1970 for all factors it is more meaningful to consider each from when it felt the

¹ Mordechai Lando, Measuring Productivity in the U. S. Shipbuilding Industry (Arlington, Va.: Center for Naval Analyses, 1969), p. 8.

subsidized program effect. Awards did not reach an appreciable level until 1958, and it took 2 and 3 years respectively for the orderbook and deliveries to be effected. The averages are;

	Awards <u>1958-1970</u>	Order-book <u>1960-1970</u>	Deliveries <u>1961-1970</u>
Total Merchant	18.1	51.6	20.6
Subsidized	14.1	37.7	13.6

Subsidized Construction Program

Criticisms of the subsidized construction program from the merchant shipbuilding industry have been numerous. Basic to all criticism is the charge that the lack of a long term funded commitment by the Government and shipping industry to construct standardized ships is at the root of most industry problems. They charge that the procurement environment has produced extreme variations in (1) shipyard workload, (2) level of employment, (3) composition of the work force, (4) level and composition of the order book, and that these have in turn resulted in low profitability, and the lack of stability necessary to attract investments and make major capital commitments.¹

¹ Seapower Subcommittee, Shipyards, Statement of E. M. Hood, President Shipbuilders Council of America, p. 10686.

Evaluation of the effects of the subsidy program must be done on both an industry and an individual shipyard basis. Industry workload, employment, work force composition, and order book have already been discussed. Another facet of employment and work force composition is the inability of the industry since 1966 to attract skilled manpower in the pipefitter, welder, shipfitter, machinist and electrical crafts. Younger men are enticed either into the higher paying construction trades or more stable industries. A 1970 study showed that the median age for these critical crafts in an East and Gulf Coast yard were 40 and 44.6 respectively. This would indicate the need for the replacement of a substantial number in the critical crafts in the next 10 years even if the work force does not grow.¹

Multiple ship awards of standardized ships are necessary to realize the learning factor benefits of series production of one design in one yard. Shipbuilding learning factors have been estimated to range from 0.87 to 0.96 and generally runs of 10 or more ships have been considered optimum.² An example

¹Ibid., p. 10665.

²A thorough research into cost variation due to delivery intervals and multiple quantities is contained in James K. McNeal, "A Method for Comparing Costs of Ships Due to Alternative Delivery Intervals and Multiple Quantities," Society of Naval Architects and Marine Engineers Transactions, LXXVII (1969), 71-110.

of this effect is the construction award of 11 LASH ships. The ships are reported to have each cost 78 per cent of their cost if built one at a time. If 3 ships only had been awarded the cost of each was estimated at 90 per cent of the one ship cost.¹

Considering the program on the basis of standardization there have been contract awards for 190 ships of 38 different ship designs in the fiscal year period 1958 to 1971 or an average of 5 ships per design. On the 38, only 3 designs totalling 51 ships have consisted of 10 or more ships, and of these only 2 designs of 30 ships have been awarded all to one yard. In both cases the awards went to Avondale; 12 C4S66a (4 in FY 1968 and 8 in FY 1963) and 18 C8S81b (LASH) (11 in FY 1968 and 7 in FY 1971).²

In addition to designs, the construction program can be considered in terms of basic types, where all designs that are variations of a type (e.g. C3S37a, C3S37b, etc.) are considered as one. Type ships are really not standard because although the hull design is similar there are often significant differences in machinery, hold arrangements,

¹Meyers, "How Important Will Subsidy Be in the Future," 368.

²This and subsequent detail data on contract awards and ship designs is compiled from MARAD data of subsidized construction contract awards for FY 1958 through 1971.

quarters, and cargo handling gear. Even minor differences in these areas can increase engineering costs and result in a loss of yard efficiency through loss of the gain in productivity associated with the learning curve. Minor changes in engineroom arrangement or power plant can require about 150 plans to be redrawn at a cost of about \$3,000 per plan. Basic quarters configuration, consisting of about 100 drawings, is another high cost area with the potential for large learning gains which can be lost through minor changes.¹ There were 23 basic types awarded in the program for an average of 8 ships per type. Of the 23 only 6 types totalling 92 ships have consisted of 10 or more ships and of these only 3 types involved cases where a shipyard received awards amounting to 10 or more ships of the type. These cases include the two designs built by Avondale and 3 awards to Bethlehem Steel, Sparrows Point for 12 ships of the C3S37 type (4 C3S37a in FY 1959 and 4 each of "b" and "c" variations in FY 1961).

Thus even when including the loosely defined ship type there have been only 3 "standard" ships for which one yard has been awarded 10 or more ships. Only in the FY 1968

¹Charles Zeien, "Ship Procurement-Isn't There a Better Way?," Marine Technology, IV, No. 3 (1967), 270.

award of LASH ships to Avondale did the yard receive the commitment to build 10 or more ships in one contract. In the other two cases the initial awards were for 4 ships followed by more in a later fiscal year. The latter were not true multi-year awards. The initial bids were developed for 4 ships only and the yards received no commitments for follow-on construction. Therefore the increased application of engineering effort and capital investment and concurrent decrease in per vessel cost expected of a 10 or more ship contract did not materialize.

Referring to Table 17 the subsidized construction program can be viewed in the context of shipyard participation. First, there were 12 shipyards which delivered ships in the 1961-1970 period, and while only Bath did not participate prior to 1966, the number delivering ships in the 1966-1970 period has reduced to 7. The number of total and subsidized ships delivered are, however, almost evenly divided between the two periods.

Second, if it has been one purpose of the program to maintain a merchant shipbuilding capability on all coasts, the West Coast has not participated to the extent of the other coasts. Annual reports on the relative costs of shipbuilding on the various coasts, required by the 1936 Act

have, computed a cost disadvantage for West Coast yards. They have concluded that this geographical cost differential is relatively small when compared with shipyard production efficiency and overhead cost differences, competitive bid differences, and differences in costs between shipyards on the same coast. Also the West Coast yards have engaged recently in naval construction.¹

Third, there is a differentiation of level of subsidized effort by shipyards.

1. Three yards (Sun, Ingalls, and Avondale) have participated equally in the two periods, each delivered 15 per cent or more of the total subsidized deliveries, and each received 80 per cent or more of its merchant ship employment from the subsidized program. They have built 82 of the 146 subsidized ships delivered. Sun has not constructed naval ships during the period while Ingalls and Avondale have divided their work between Navy and merchant. Considering these shipyards in terms of subsidized ship awards for fiscal years 1958-1971 only Avondale has bettered the total program average for ships awarded by design or type. Avondale's averages are 6.7 ships per design and 9.4 ships per type. Thus while these yards received the major portion of their

¹MARAD, Relative Cost of Shipbuilding, pp. 3-5.

merchant ship employment from the subsidized program only one fared better than the average in obtaining standardization of employment. When considered on a ship per contract basis Avondale and Ingalls averaged better than 4 per contract and Sun only 3 per contract. In all cases a very limited commitment upon which to amortize engineering costs and capital investments.

2. Three yards (Bethlehem Steel Sparrows Point, Newport News, and National Steel) participated significantly during the first 5 year period only. In total they have produced 45 of the subsidized ships. Bethlehem has been the largest builder of merchant ships in the U. S., most of which have been tankers. Newport News and National Steel have recently participated heavily in naval construction. The subsidized construction in these yards is characterized by a heavy concentration followed by a 4-7 year period without any awards. When awards are considered by type and design they are below the average, and on a ships per contract basis are between 2 and 3. The President of Newport News has stated before Congress that their average profitability for government construction during the years 1965-1969 was only $\frac{1}{4}$ that of their other business (government business during this period involved naval construction and the construction and delivery of 5 subsidized

ships.) He also noted that they would need awards of 8-10 ships of a particular design per year to operate profitably.¹

3. The remaining yards (excepting the two recently opened yards) make up the final grouping. This grouping is characterized primarily by the smaller shipyards which have participated only sporadically in subsidized construction. To some degree they have been an unstabilizing influence. A case in point is Bath Iron Works; in testimony before Congress their President stated that they had a loss on the 3 delivered merchant ships, which they were willing to take as the cost of learning the business.² It appears the same philosophy may have been followed in 1970 bidding when with no other construction backlog, Bath under bid three other shipyards by 8.5 to 25.4 per cent.³

Alternative Construction Subsidy Program

Building on the background developed in Chapter IV an alternative to the subsidized construction program could have been one which, (1) fostered the development containerships and thereby reduced the need for ODS, and which (2) subsidized

¹Seapower Subcommittee, Shipyards, pp. 10906 and 10942.

²Seapower Subcommittee, Shipyards, p. 10730.

³MARAD, Relative Cost of Shipbuilding, p. 33.

the construction of a bulk carrier fleet. The two aspects considered separately below both assume the availability of profitable employment for the ships when built, no increase in government subsidy expenditures, and would have required no change in legislation.

1. If commencing in 1962 standardized containerships were constructed in lieu of breakbulk liners the annual new construction subsidy expenditure (Table 4) could have been retained at near its \$137 million peak while ODS expenditures decreased as the more productive ships entered service. Total government subsidy expenditures would not increase. Assuming a per ship cost of \$17.5 million and a 50 per cent subsidy, 161 ships could have been awarded in the fiscal year 1962-1971 period as opposed to the actual number of 116. The additional 4.5 ships per year for this period would have been better than Avondale's average of 4.4 ship awards per year and more than twice that of any other shipyard. It could provide full employment for a 50,000 ton steel output per year shipyard; the size of Bath or National Steel.

2. Commencing in 1966 30 standard bulk carriers could have been constructed at the rate of 5 per year with 50 per cent subsidy ultimately financed from preference rate savings. This also would have provided full employment for

the equivalent of one 50,000 ton per year shipyard commencing in 1966.¹

Of course if both programs involved multiyear contracts involving one shipyard each, the commitment would have been sufficient to underwrite substantial capital improvements and engineering design costs. The contracts could have been profitable and the competitive position of the shipyards enhanced.

Effect of the Merchant Marine Act of 1970

The prospective effects of the 1970 Act on the shipbuilding industry can be measured by the answers to 3 questions.

1. Will the 300 standardized ships actually be constructed in the 10 year period ending in fiscal year 1980?

2. Can the shipyards meet the challenge of the decreasing subsidy limits?

3. What will be the condition of the major U. S. shipyards at the end of the 10 year program?

Considering the first question the program is already behind schedule by at least 2 years. The fiscal year 1972 program was budgeted for 22 ships and was stated to represent the "second and final year of the initial buildup phase" to

¹ Assumes 10,000 tons per containership and 8,000 tons per bulk carrier.

the 30 ship per year program.¹ The fiscal year 1973 program however is estimated at only 15 ships and is described as the "third and final year" of the buildup to a 30 ship per year program by 1974.² The causes of the delay have been attributed to a sharp decline in the international shipping market in 1971, a decrease in charter rates, further decline in U. S. flag cargoes, and the generally poor earnings of U. S. operators which have discouraged investment capital for new ships.³ In short government funds have been available but private funds have not, and the program will therefore include only 49 ships through its first 3 years.

There is however a large backlog of pending construction subsidy applications and if conditions for investment improve it would be expected that many will actually result in construction, but over some extended time period such as 3 to 4 years. In mid 1971 there were 52 applications from unsubsidized operators including 11 LASH, 31 OBO, and 10 tankers, as compared with only 5 pending in mid 1970.⁴ In

¹FY 1972 Budget Appendix, p. 272.

²FY 1973 Budget Appendix, p. 270.

³Shipyard Weekly No. 37 (Sept. 16, 1971) and No. 52 (Dec. 30, 1971).

⁴MARAD, Annual Report FY 1970, p. 25.

addition subsidized operators had replacement commitments for 35 ships in fiscal years 1972 and 1973, including 5 LASH and 30 cargo.¹

To date there is only one standard design in series production, the LASH ship. Avondale has 18 constructed or on order and there are applications pending for 17 more. The LASH system is actually a patented design and not a product of the new program. It is fairly certain that OBO and tanker designs will also reach series production of standard ships but there appears to be resistance from subsidized operators to acceptance of standard general cargo and containership designs.

On the basis of all information it would appear that the 300 ship goal will probably be met, but not until fiscal year 1985 for an average construction of 21 ships per year from 1974 through 1985.

The challenge of meeting the reducing subsidy limits is effected by a number of factors; (1) the relative variation of U. S. and foreign shipbuilding costs, (2) the construction mix and attainability of series production of standard designs engineered for efficient production, and (3) the commitment of

¹"U. S. Shipbuilding Outlook," Marine Engineering/Log, LXXVI, No. 7 (1971), 7-11.

capital investments necessary to reduce labor costs and modernize the industry.

On the first item it must be remembered that the construction subsidy is the relative difference between U. S. and foreign shipbuilding costs. In recent years foreign costs have risen more rapidly than in the U. S. This has been a major factor in the industry's ability to reduce the overall subsidy rate by 8 per cent between 1969 and 1971. Speaking of the effect of rising foreign prices on CDS E. M. Hood of the Shipbuilder's Council of America has stated, "It is in this sense that the declining scale . . . will be met."¹

The problem of standard designs has been discussed above. As of now the most pressing problems are the lack of shipping industry acceptance of the standard general cargo and containership designs that have been developed under MARAD sponsorship, and the fact that only one ship design has gone into series production.²

On the last account productivity and capital investment in the shipbuilding industry are on the rise. A recent study

¹ Shipyard Weekly, No. 49 (Dec. 3, 1970).

² For a discussion of the designs refer to Ronald K. Kiss and John J. Garvey, "CMX Designs-Merchant Ships for the 70's," Marine Technology, VII, No. 4 (1970), 409-424.

of a number of productivity indexes for the period 1958 to 1966 showed that productivity for the entire shipbuilding and repair industry increased over 10 per cent. The increase was ascribed to the increased demand for naval ships during the period since the productivity in the Navy related construction and repair increased by about 17 per cent. New technology was not considered a factor because the capital investments in 1966 were only 2.3 per cent of the value of work done, approximately the same as the 1958 level.¹ Since then capital investment has been increasing steadily. In 1969 and 1970 it was estimated at \$100 million, up from \$53 million in 1966, and the capital investment to value of work done ratio was also up to 3.7 per cent. The change is even more dramatic when considered on a capital expenditure per production worker basis;²

1958 - \$382 1968 - \$649

1966 - \$462 1970 - \$930

It is apparent that, while the shipbuilding industry is willing to increase capital expenditures and improve productivity, its ability to meet the declining subsidies is tied

¹Lando, Productivity in the Shipbuilding Industry, pp. 3-7.

²Based on 1958-1968 data and 1969-1970 estimates in Dept. of Commerce, Industrial Outlook 1971, pp. 380-82; and Shipbuilders Council of America, 1970 Annual Report, pp. 6 and 19.

primarily to the actions of foreign shipyards and the shipping industries commitment to series production of standard ship designs.

In considering the impact of the program on the industry, both naval and merchant ship workload must be considered. Naval construction dollars are expected to remain high, but there will be a contraction in the number of the major private shipyards participating. The reasons for this are three fold; (1) the ships will be more sophisticated and expensive therefore fewer will be built; (2) nuclear ship construction will increase concentrating work in the nuclear qualified major private shipyards (There are presently two, Newport News and Ingalls, the latter being qualified for submarine nuclear construction only.); (3) increased use of series production through multiyear contract awards such as the recent LST 1179, DE 1078, DD 963, and LHA programs will concentrate non-nuclear work in fewer shipyards.

Series production through multiyear awards of subsidized construction will also concentrate major merchant ship construction in fewer yards, which will have invested heavily in capital improvements. Indications of this are studies by MARAD and two MARAD sponsored shipyards which

estimate an investment of \$125 million in a new production facility plus series production are required to reduce CDS to the 35 per cent rate and still return a reasonable profit on investment. The optimum steel output for such a yard would be 150,000 tons per year, the equivalent of 15 containerhips or 10-70,000 DWT tankers. Thus on the basis of steel output the optimum yard could produce 1/3 to 1/2 of the 30 ship per year MARAD program.¹

MARAD has estimated that 6 to 8 shipyards will participate in naval and merchant construction in the 1970's.² More interesting however is a linear programming model of the effects of two government programs on the U. S. private ship-building industry in the 1970's. The key parameters and results of the simulation for a program solution that allocated ship orders to yards based on lowest costs is presented in Table 20. The study also emphasized the impact of a new shipyard (the Litton Ship Systems Yard) in being able to build ships at lower costs and predicted full employment for that yard even under the small program. A policy of equalizing capacity utilization in all shipyards

¹Seapower Subcommittee, Shipyards, pp. 10661-662 and 10956.

²Ibid., pp. 10660 and 10713.

TABLE 20

A SIMULATION OF THE U. S. SHIPBUILDING INDUSTRY
FOR THE 1970's

	Construction Program Size	
	<u>Small</u>	<u>Large</u>
Average no. ships per year	36	69
Naval ships per year	16	22
Merchant ships per year	20	47
Subsidized merchant per year	11	22
Shipyards Employed		
Early 1970's	8	9-10
Mid and later 1970's	5	9-10

Source: William F. Beazer, et al., An Economic Analysis of the U. S. Shipbuilding Industry for the 1970's (Arlington, Va.: Institute for Defense Analyses, 1969), pp. xi-xvi.

was also investigated and found to yield use rates for the small program of 40 per cent or less. The equalization program did have the benefit of encouraging modernization in more shipyards, but at an additional 10 per cent cost per year to the ship buyers.¹

Three years have passed since the study was made and its predictions are not valid for the early 1970's, but they do provide insight as to what the industry may be in the early 1980's. The small program is less than that expected over the next decade. Also its cost minimizing solution results in several merchant ship construction runs of over 30 ships, which is probably more than can be expected. Since both these factors tend to minimize the number of shipyards employed, 5 is considered the lower limit on the shipyards that will be engaged in construction in the early 1980's. Similarly, the large program is greater than that which will develop because the unsubsidized merchant construction will probably be 15 vice 25. Therefore it places an upper limit on the shipyards of 9 to 10. It then follows that an estimate of 6 to 8 modernized shipyards, possibly including a new yard

¹William F. Beazer, et al., An Economic Analysis of the U. S. Shipbuilding Industry for the 1970's (Arlington, Va.: Institute for Defense Analyses, 1969), pp. xi-xvi.

not now in existence, will comprise the major shipbuilding industry in the early 1980's.

Summary

The major private shipbuilding industry consists presently of 17 shipyards of widely differing size, capabilities, resources, and workload mixes. Ship construction is the primary activity of these shipyards and since 1958 Navy construction has employed about 67 per cent of the production force. The subsidized construction program has accounted for 67 per cent of the merchant ship deliveries in the period 1961 to 1970. While it has been larger and more stable than unsubsidized construction, there still have been a number of major changes in program level which have had a disruptive influence on the industry.

When considered on a shipyard by shipyard basis the subsidy program is shown to be even more unstable. Because it has encouraged the development of numerous designs individualized to each owners desires, shipyards have been unable to obtain long term contracts for series production of a single design. The lack of incentives for capital improvement coupled with the lack of shipyard participation in the design process so as to engineer ships for efficient

production are two of the major failings of the subsidized construction program.

The 1970 Act with its emphasis on multiyear contracts for the construction of standard designs will provide better employment for the industry. At the conclusion of the 300 ship program, probably less than $\frac{1}{2}$ of the present shipyards will remain. Those that do will either be new or significantly modernized.

VI. SUMMARY AND CONCLUSIONS

The fortunes of the U. S. merchant marine and U. S. shipbuilding industry have been coupled since the founding of the nation. First joined by the requirement that a ship must be constructed in a U. S. shipyard in order to be eligible for U. S. registry, they have been subsequently linked through Federal maritime policy and the system of subsidy supports which implement the policy.

Because of this linkage it is best to summarize the answers to the research and subsidiary questions in two parts. The first part is concerned with questions of joint import to the merchant marine and the shipbuilding industry. That is the questions of U. S. policy toward both; the subsidy programs which provide major support to the shipbuilding industry; the evaluation of subsidy programs as a stimulus to ship replacement; and the expectations for the effect of the Merchant Marine Act of 1970 on these matters. The second part considers questions related specifically to the major private shipyards; the identification of the private shipyards engaged in merchant ship construction; the

relative importance of subsidized construction to their total workload; the characteristics of subsidized construction which might enhance stability and modernization in the industry; and the expected effect of the 1970 Act on the industry.

The Merchant Marine and the Shipbuilding Industry

Federal maritime policy, as proclaimed by the Merchant Marine Act, 1936 and its amendments, states that it is necessary for reasons of national defense and the development of foreign and domestic commerce to have a privately owned U. S. flag merchant marine, composed of the best-equipped and most suitable ships, constructed and maintained by an efficient U. S. shipbuilding and repair industry, and manned by citizen personnel. It is intended to be capable of carrying all domestic commerce, a substantial portion of our foreign commerce on essential trade routes, and acting as a naval auxiliary when needed. The domestic segment of the merchant marine, already protected from foreign competition by cabotage laws, receives small direct benefit from the Act. The non-liner and tanker segments of the foreign trade fleet were originally excluded from support because they do not provide regular service on essential trade routes. The primary recipient of direct government support has been the foreign

trade liner fleet. The major portion of this fleet receives direct support through Federal subsidies of daily operations and ship replacement. The subsidies are designed to equalize U. S. liner costs with those of a competitive foreign liner. It is via the latter construction subsidy that the shipbuilding industry receives its major support from the Federal Government. Until the Merchant Marine Act of 1970 there was no direct Federal construction subsidy to the shipbuilding industry independent of a liner construction contract.

In 1954, faced with block obsolescence of the World War II built fleet by 1970, the Government and subsidized liner operators embarked on a construction program designed to replace the 300 ship fleet by the early 1970's. The program, concentrating on high speed breakbulk cargo liners, failed to meet its goal and through 1970 only 158 ships had been delivered. The program failed basically on two accounts. First there was no policy declaration defining "substantial portion" and therefore no effective Federal program to expand or maintain U. S. liner carryings either on an absolute tonnage or share of the market basis. U. S. carryings, as measured by both indices have declined, thus eroding the financial condition of the subsidized operators and limiting the ability to meet their replacement commitments. Secondly,

the ships constructed were not sufficiently productive to operate profitably even with subsidy. They were constructed in small lots, individualized to owners requirements, yet with arbitrary speed criteria set by the Government. The latter, determined primarily for national defense reasons, increased ship and crew costs often with no commercial benefit. More important however, the designs involved no reduction in cargo handling and in port costs which after subsidy were the operator's major out of pocket costs. The failure to foster the development of containerization has been the major technical deficiency in the replacement program. It plus the failure to initiate a market development program are the primary reasons why the operating differential subsidy has preempted 2/3 of the direct subsidy appropriations, and has limited construction subsidy funding since 1962.

Lacking explicit national defense and commercial objectives the measures of success or failure of the direct liner subsidy program became the degree to which cost parity for the liners was or was not achieved. In such an atmosphere the most that can be said of the construction program is that it achieved some level greater than if there had been no subsidy. Without explicit objectives it could develop neither an efficient liner fleet nor an efficient shipbuilding industry.

The Government also supports unsubsidized liners and non-liners through cargo preference statutes which basically require that 50 per cent of government sponsored cargoes be reserved for U. S. ships. These ships, which cannot compete profitably with foreign ships, are employed at a preference rate which is generally $1\frac{1}{2}$ to 2 times the foreign shipping rate. The cost of this program is not as visible as the direct liner subsidies because it is administered by a number of agencies with funds that are not specifically identified in Federal appropriations as a subsidy. The costs can only be estimated. The total preference differential for 1969, excluding defense cargoes, approximated \$114 million. This is the largest merchant marine subsidy expenditure after the operating subsidy and some 20 per cent greater than the construction subsidy for 1969. The bankruptcy of preference rates as far as a viable merchant marine is concerned is that none of the features of the 1936 Act which commit liner operators to ship replacement are included. The results have been the maintenance of an overage fleet (approximately 90 per cent over 20 years old) which depends on preference rates for 70 per cent of its cargo. This situation was allowed to develop even though 1952 legislation permitted construction subsidy of bulk carriers (most preference cargoes

are bulk shipments), and 30 bulk carriers, built with 50 per cent subsidy, could replace the 106 most inefficient non-liners and return the subsidy investment in 6 years operation at reduced preference rates.

The Merchant Marine Act of 1970 proposes to correct the above noted deficiencies. It sets both a cargo carriage and a construction goal to be attained by 1980. Multiyear construction of standard, high productive ships are emphasized. Both dry and liquid bulk carriers are to be included in the construction program and be eligible for operating differential subsidy; both for the explicit purpose of modernizing that segment of the fleet and the eventual elimination of preference rates.

The Shipbuilding Industry

The segment of the shipbuilding industry capable of building ocean going ships for the merchant marine consists of 17 shipyards, 12 of which are building or have built ships for the merchant marine, and 11 of which have been involved in subsidized construction. These major shipyards differ widely in their financial condition, plant assets, capabilities, stability of employment, and construction mix. The shipyards like the Navy and merchant marine are primarily products of World War II. Only one new shipyard has been built since

that time, the Litton Ship Systems facility on the Gulf Coast.

Ship construction is the primary activity of these yards and since 1959 Navy construction has employed 61 to 73 per cent of their construction work force. Because of high costs they have not competed for foreign construction since their last foreign deliveries in 1960. Construction of U. S. merchant ships for private owners without subsidy has been highly variable and has consisted primarily of tankers for the domestic fleet. The subsidized construction program has been the major source of merchant construction for the industry. Of 191 merchant ships delivered between 1961 and 1970, 146 were subsidized. Were it not for subsidized construction, merchant ship awards between 1958 and 1966 would have averaged less than 4 per year.

When viewed in detail however subsidized construction has not been a very stable source of employment for the industry, nor has it encouraged improved production techniques and capital investment. The proliferation of individual ship designs developed to meet owner desires has resulted in an average of 5 ships per identical design and on the order of 3 ships per contract. Both well below the numbers necessary to realize learning curve benefits and amortize the size of

engineering costs and capital investments which are needed to produce efficiently. Three shipyards have participated heavily in the subsidy program to the extent that each delivered 15 per cent or more of the subsidized deliveries, and that work has represented better than 80 per cent of their merchant construction. Even in this group there is only one, that of all the shipyards, has received a commitment to build 10 or more ships in a single contract.

That the subsidy program could have better developed both a modern merchant marine and a more efficient shipbuilding industry is evident. Just the decision to build more productive containerships instead of increasing operating subsidies to breakbulk liners, and to build those 30 bulk carriers would have provided construction employment double that experienced by the most well supported shipyard.

The Merchant Marine Act of 1970 is supposed to correct these deficiencies. Its multiyear construction of standard ships designed for efficient production is intended to encourage the capital investment in new facilities at the same time reducing the amount of construction subsidy required. The program is already behind schedule on ship awards because of lack of private funding and only one type ship is in series production. A several year stretchout beyond 1980 can be

anticipated. The shipyards however have demonstrated through recent actions that given the opportunity for efficient production they are ready to commit the necessary resources.

Inherent in the program is a reduction in the number of participating shipyards. This tendency is paralleled by a similar bias in the Navy's construction programs. The result will probably be a reduction to 6-8 shipyards actively engaged in naval and merchant marine construction in the early 1980's.

Overall the subsidy programs could have developed a more productive merchant marine and shipbuilding industry for no more than has been expended in the last 15 years. To do this would have required the explicit statement of both national defense and commercial objectives for the merchant marine and the shipbuilding industry. The latter is most important, for as much as anything else, it has been the lack of a clear government commitment to a prosperous merchant marine that has limited the availability of investment capital. Commercial objectives should have included the expansion of U. S. flag markets and the development and construction of standardized productive ships. Such a program could not only have better modernized the merchant marine and eliminated the totally government supported non-liner fleet, but it also

could have encouraged the modernization of several of the major private shipyards. The Merchant Marine Act of 1970 goes along way towards accomplishing the needed reforms, but has not as yet attracted the private investment capital necessary to meet its goals.

GLOSSARY

breakbulk	Packaged cargo that must be stowed aboard ship.
CDS	Construction-differential subsidy
deadweight (DWT)	Difference between the weight of a vessel in the load and light condition measured in long tons.
dry bulk	Cargoes that can be placed aboard ship unpackaged such as grain, minerals, and ores.
gross tons	Total internal capacity of a ship in units of 100 cubic feet.
liner service	Composed of vessels carrying break-bulk cargo over fixed itineraries on regular schedules.
MARAD	Maritime Administration
non-liner service	Composed of tramp vessels and dry bulk carriers operating without fixed itinerary or schedules.
NDRF	National Defense Reserve Fleet

ODS	Operating-differential subsidy
subsidized operator	Ship operator whose ships are constructed with government CDS assistance and receives ODS to compensate for the differential between U. S. and foreign operating costs.
tramp	Non-liner shipping generally designed for breakbulk cargoes which are utilized in breakbulk and dry bulk trades.
unsubsidized operators	Operators who do not receive ODS and CDS.

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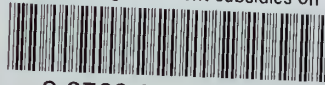
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